Dominion Energy Services, Inc.
5000 Dominion Boulevard
Glen Allen, VA 23060
DominionEnergy.com

Dominion Energy®

July 14, 2017

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JUL 20 2017
MARINE RESOURCES COMMISSION

Mr. Randy Owen
Virginia Marine Resources Commission Main Office
2600 Washington Avenue, 3rd Floor
Newport News, VA 23607

Re: Dominion Energy Transmission, Inc. – Atlantic Coast Pipeline
Virginia Joint Permit Application Submittal (Revision)

ADDITIONAL INFO
REVISION

Dear Mr. Owen:

Atlantic Coast Pipeline, LLC (Atlantic) is submitting the enclosed revised Joint Permit Application (JPA) , serving as Pre-construction Notification for Authorization under Section 10 and Section 408 of the Rivers and Harbors Act, Section 404 of the Clean Water Act for Nationwide Permit 12 (Utility Line Activities), and Virginia Water Quality Certificate under Section 401 of the Clean Water Act, Virginia Water Protection Permit, Stream Crossing Permit, and the Tidal Wetland Permit, for the proposed Atlantic Coast Pipeline with within the Commonwealth of Virginia and the U.S. Army Corps of Engineers (COE), Norfolk District. The materials included conform to the requirements of JPA. In addition, Atlantic is requesting a preliminary jurisdictional determination for wetlands and waterbodies crossed within the COE – Norfolk District.

Atlantic is a company formed by four major U.S. energy companies – Dominion Energy, Duke Energy, Piedmont Natural Gas, and Southern Company Gas. The company was created to develop, own, and operate the proposed ACP, an approximately 600-mile-long, interstate natural gas transmission pipeline system designed to meet growing energy needs in Virginia and North Carolina. Atlantic has contracted with Dominion Energy Transmission, Inc., a subsidiary of Dominion, to seek authorization from the Federal Energy Regulatory Commission under Section 7(c) of the Natural Gas Act to construct, own, operate, and maintain the ACP on behalf of Atlantic.

Atlantic appreciates your efforts and coordination to date. Please contact Richard Gangle at (804) 273-2814 or Richard.B.Gangle@dom.com, if there are questions regarding this submittal.

Please direct written responses to:

Richard B. Gangle
Dominion Energy Services, Inc.
5000 Dominion Boulevard
Glen Allen, Virginia 23060

Sincerely,

Robert M. Bisha
Technical Advisor, Atlantic Coast Pipeline

cc: Richard B. Gangle (Dominion Energy)

Attachments:

- 3 hard copies of Atlantic Coast Pipeline, Virginia Joint Permit Application
- Hard copy binders include 1 DVD each, with an electronic version of all application materials

FOR AGENCY USE ONLY	
ADDITIONAL INFO REVISION	Notes:
JPA# 15-1353	

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APPLICANTS

PLEASE PRINT OR TYPE ALL ANSWERS. If a question does not apply to your project, please print N/A (not applicable) in the space provided. ***If additional space is needed, attach extra 8 ½ x 11 inch sheets of paper.***

Check all that apply			
Pre-Construction Notification (PCN) ☒ NWP # 12 *(For Nationwide Permits ONLY - No DEQ-VWP permit writer will be assigned)*	SPGP ☐	DEQ Reapplication ☐ Existing permit number:	Receiving federal funds ☐ Agency providing funding:

PREVIOUS ACTIONS RELATED TO THE PROPOSED WORK (include all federal, state, and local pre-application coordination, site visits, previous permits, or applications whether issued, withdrawn, or denied)

Historical information for past permit submittals can be found online with VMRC - https://webapps.mrc.virginia.gov/public/habitat/ - or VIMS - http://ccrm.vims.edu/perms/newpermits.html

Agency	Action / Activity	Permit/Project number, including any non-reporting Nationwide permits previously used (e.g., NWP 13)	Date of Action	If denied, give reason for denial
	See the Supplement, Introduction Section			

1. APPLICANT, AGENT, PROPERTY OWNER, AND CONTRACTOR INFORMATION
The applicant(s) is/are the legal entity to which the permit may be issued (see How to Apply at beginning of form). The applicant(s) can either be the property owner(s) or the person/people/company(ies) that intend(s) to undertake the activity. The agent is the person or company that is representing the applicant(s). If a company, please also provide the company name that is registered with the State Corporation Commission (SCC), or indicate no registration with the SCC.

Legal Name(s) of Applicant(s)			Agent (if applicable)		
Leslie Hartz, Atlantic Coast Pipeline, LLC			Richard Gangle, Dominion Resources Services, Inc.		
Mailing address 707 E Main Street, 19th Floor			Mailing address 5000 Dominion Blvd.		
City Richmond	State VA	ZIP Code 23219	City Glen Allen	State VA	ZIP Code 23060
Phone number w/area code 804.771.4468	Fax		Phone number w/area code	Fax	
Mobile	E-mail leslie.hartz@dom.com		Mobile	E-mail richard.b.gangle@dom.com	
State Corporation Commission Name and ID number (if applicable)			State Corporation Commission Name and ID number (if applicable)		

Certain permits or permit authorizations may be provided via electronic mail. If the applicant wishes to receive their permit via electronic mail, please provide an e-mail address here: leslie.hartz@dom.com

1. APPLICANT, AGENT, PROPERTY OWNER, AND CONTRACTOR INFORMATION (Continued)							
Property owner(s) legal name, if different from applicant				Contractor, if known			
Mailing address				Mailing address			
City	State	ZIP code		City	State	ZIP code	
Phone number w/area code	Fax			Phone number w/area code	Fax		
Mobile	E-mail			Mobile	E-mail		
State Corporation Commission Name and ID number (if applicable)				State Corporation Commission Name ID number (if applicable)			

2. PROJECT LOCATION INFORMATION
(Attach a copy of a detailed map, such as a USGS topographic map or street map showing the site location and project boundary, so that it may be located for inspection. Include an arrow indicating the north direction. Include the drainage area if the SPGP box is checked on Page 7.)

Street Address (911 address if available)	City/County/ZIP Code
See Supplement Document Section 2.0	Project covers multiple counties and zip codes in Virginia
Subdivision	Lot/Block/Parcel #
N/A	N/A

Name of water body(ies) within project boundaries and drainage area (acres or square miles).
See the Supplemental Document, Appendix B Tables, Wetland and Waterbody Crossing and Impact Tables

Tributary(ies) to: See Appendix B, Wetland and Waterbody Crossing Tables
Basin: See Appendix B Sub-basin: See Appendix B
(*Example: Basin: James River Sub-basin: Middle James River*)

Special Standards (based on DEQ Water Quality Standards 9VAC25-260 et seq.): See Table D-1 Appendix B for Designated Use

Project type (check one)
____ Single user (private, non-commercial, residential)
x Multi-user (community, commercial, industrial, government)
____ Surface water withdrawal

Latitude and longitude at center of project site (decimal degrees): See Supplemental Information / -
(Example: 37.33164/-77.68200)

USGS topographic map name: See Table 2.1-1 for a list of USGS quandrangle maps

8-digit USGS Hydrologic Unit Code (HUC) for your project site (See http://cfpub.epa.gov/surf/locate/index.cfm): See Appendix B
If known, indicate the 10-digit and 12-digit USGS HUCs (see http://dswcapps.dcr.virginia.gov/htdocs/mans/HUExplorer.htm):

Name of your project (*Example: Water Creek driveway crossing*) Atlantic Coast Pipeline (ACP)

Is there an access road to the project? ☑ Yes ☐ No. If yes, check all that apply: ☑ public ☑ private ☑ improved ☑ unimproved

Total size of the project area (in acres): See Section 2.0 of the Supplemental Information

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2. PROJECT LOCATION INFORMATION (Continued)

Provide driving directions to your site, giving distances from the best and nearest visible landmarks or major intersections:

See maps in Appendix A; WV/VA AP-1: 0.2 mile west of WV/VA border Hwy 84; right on QWJ FS Rd 55, travel 2.8 mi. to project. NC/VA AP-1: approx. 1.5 mi. south of the VA/NC border on Interstate 95 travel east on Hwy 48 for 3 miles to Pleasant Hill, NC, then north Hwy 301 for 0.9 mi.; east on Forest Rd (662)1.3 miles to mainline (NC/VA border). NC/VA AP-3: approx. 3.4 mi. southwest of Branchville, VA on Hugo Rd (Hwy 186). VA AP-3: From Norfolk, VA travel south on Interstate Martin Luther King Jr. Hwy (Interstate 464) for 5.1 mi. Exit west on Military Highway South (Hwy 13) and drive 0.3 mi. Head south on Bainbridge Blvd (166) for 0.1 mi.

Does your project site cross boundaries of two or more localities (i.e., cities/counties/towns)? [✓] Yes [ ] No

If so, name those localities: See maps in Supplemental Information, Appendix A

3. DESCRIPTION OF THE PROJECT, PROJECT PRIMARY AND SECONDARY *PURPOSES*, PROJECT *NEED*, INTENDED USE(S), AND ALTERNATIVES CONSIDERED (Attach additional sheets if necessary)

- The purpose and need must include any new development or expansion of an existing land use and/or proposed future use of residual land.
- Describe the physical alteration of surface waters, including the use of pilings (#, materials), vibratory hammers, explosives, and hydraulic dredging, when applicable, and *whether or not tree clearing will occur* (include the area in square feet and time of year).
- Include a description of alternatives considered and measures taken to avoid or minimize impacts to surface waters, including wetlands, to the maximum extent practicable. Include factors such as, but not limited to, alternative construction technologies, alternative project layout and design, alternative locations, local land use regulations, and existing infrastructure
- For utility crossings, include both alternative routes and alternative construction methodologies considered
- For surface water withdrawals, public surface water supply withdrawals, or projects that will alter in-stream flows, include the water supply issues that form the basis of the proposed project.

See Supplemental Information Section 3.0 for a detailed description of the project, purposes, need, and alternatives considered for the ACP.

Date of proposed commencement of work (MM/DD/YYYY)	Date of proposed completion of work (MM/DD/YYYY)
November 16, 2017	December 2019
Are you submitting this application at the direction of any state, local, or federal agency? [ ] Yes [✓] No	Has any work commenced or has any portion of the project for which you are seeking a permit been completed? [ ] Yes [✓] No

If you answered "yes" to either question above, give details stating when the work was completed and/or when it commenced, who performed the work, and which agency (if any) directed you to submit this application. In addition, you will need to clearly differentiate between completed work and proposed work on your project drawings.

N/A

Are you aware of any unresolved violations of environmental law or litigation involving the property? [ ] Yes [✓] No
(If yes, please explain)

N/A

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4. PROJECT COSTS

Approximate cost of the entire project, including materials and labor: $ 1,400,000,000.00

Approximate cost of only the portion of the project affecting state waters (channelward of mean low water in tidal areas and below ordinary high water mark in nontidal areas): $ See Section 4.0

5. PUBLIC NOTIFICATION (Attach additional sheets if necessary)

Complete information for all property owners adjacent to the project site and across the waterway, if the waterway is less than 500 feet in width. If your project is located within a cove, you will need to provide names and mailing addresses for all property owners within the cove. If you own the adjacent lot, provide the requested information for the first adjacent parcel beyond your property line.

Failure to provide this information may result in a delay in the processing of your application by VMRC.

Property owner's name	Mailing address	City	State	ZIP code
See Landowner List in Appendix J, for landowners adjacent to subaqueous lands crossings (perennial waterbodies with greater than 5 square mile watershed).				

Name of newspaper having general circulation in the area of the project: See Table 5.0-1 in the Supplemental Information

Address and phone number (including area code) of newspaper _____

Have adjacent property owners been notified with forms in Appendix A? ☐ Yes ☑ No (attach copies of distributed forms)

6. THREATENED AND ENDANGERED SPECIES INFORMATION

Please provide any information concerning the potential for your project to impact state and/or federally threatened and endangered species (listed or proposed). Attach correspondence from agencies and/or reference materials that address potential impacts, such as database search results or confirmed waters and wetlands delineation/jurisdictional determination. Include information when applicable regarding the location of the project in Endangered Species Act-designated or -critical habitats. Contact information for the U.S. Fish and Wildlife Service, National Oceanic and Atmospheric Administration, Virginia Dept. of Game and Inland Fisheries, and the Virginia Dept. of Conservation and Recreation-Division of Natural Heritage can be found on page 4 of this package.

7. HISTORIC RESOURCES INFORMATION

Note: Historic properties include but are not limited to archeological sites, battlefields, Civil War earthworks, graveyards, buildings, bridges, canals, etc. Prospective permittees should be aware that section 110k of the NHPA (16 U.S.C. 470h-2(k)) prevents the USACE from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of Section 106 of the NHPA, has intentionally significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the USACE, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. See Section 7.0 for all information for this section

Are any historic properties located within or adjacent to the project site? ☐ Yes ☐ No ☐ Uncertain
If Yes, please provide a map showing the location of the historic property within or adjacent to the project site.

Are there any buildings or structures 50 years old or older located on the project site? ☐ Yes ☐ No ☐ Uncertain
If Yes, please provide a map showing the location of these buildings or structures on the project site.
Is your project located within a historic district? ☐ Yes ☐ No ☐ Uncertain
If Yes, please indicate which district: _____

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7. HISTORIC RESOURCES INFORMATION (Continued)

Has a survey to locate archeological sites and/or historic structures been carried out on the property?
☐ Yes ☐ No ☐ Uncertain

If Yes, please provide the following information: Date of Survey: _____

Name of firm: _____

Is there a report on file with the Virginia Department of Historic Resources? ☐ Yes ☐ No ☐ Uncertain

Title of Cultural Resources Management (CRM) report: _____

Was any historic property located? ☐ Yes ☐ No ☐ Uncertain

8. WETLANDS, WATERS, AND DUNES/BEACHES IMPACT INFORMATION

Report each impact site in a separate column. If needed, attach additional sheets using a similar table format. Please ensure that the associated project drawings clearly depict the location and footprint of each numbered impact site. For dredging, mining, and excavating projects, use Section 17.

	Impact site number 1	Impact site number 2	Impact site number 3	Impact site number 4	Impact site number 5
Impact description (use all that apply): F=fill EX=excavation S=Structure T=tidal NT=non-tidal TE=temporary PE=permanent PR=perennial IN=intermittent SB=subaqueous bottom DB=dune/beach IS=hydrologically isolated V=vegetated NV=non-vegetated MC=Mechanized Clearing of PFO *(Example: F, NT, PE, V)*	See Section 8.0 of the Supplemental Information and the Tables in Appendix B of the Supplemental Information for impact site data.				
Latitude / Longitude (in decimal degrees)					
Wetland/waters impact area (square feet / acres)					
Dune/beach impact area (square feet)					
Stream dimensions at impact site (length and average width in linear feet, and area in square feet)					
Volume of fill below Mean High Water or Ordinary High Water (cubic yards)					

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8. WETLANDS/WATERS IMPACT INFORMATION (Continued)					
Cowardin classification of impacted wetland/water or geomorphological classification of stream *Example wetland: PFO; Example stream: 'C' channel and if tidal, whether vegetated or non-vegetated wetlands per Section 28.2-1300 of the Code of Virginia*					
Average stream flow at site (flow rate under normal rainfall conditions in cubic feet per second) and method of deriving it (gage, estimate, etc.)					
Contributing drainage area in acres or square miles (*VMRC cannot complete review without this information*)					
DEQ classification of impacted resource(s): Estuarine Class II Non-tidal waters Class III Mountainous zone waters Class IV Stockable trout waters Class V Natural trout waters Class VI Wetlands Class VII http://leg1.state.va.us/cgi-bin/legp504.exe?000+reg+9VAC25-260-50					
For DEQ permitting purposes, also submit as part of this section a wetland and waters boundary delineation map – see (3) in the Footnotes section in the form instructions.					
For DEQ permitting purposes, also submit as part of this section a written disclosure of all wetlands, open water, or streams that are located within the proposed project or compensation areas that are also under a deed restriction, conservation easement, restrictive covenant, or other land-use protective instrument.					

9. APPLICANT, AGENT, PROPRTY OWNER, AND CONTRACTOR CERTIFICATIONS

READ ALL OF THE FOLLOWING CAREFULLY BEFORE SIGNING

PRIVACY ACT STATEMENT: The Department of the Army permit program is authorized by Section 10 of the Rivers and Harbors Act of 1899, Section 404 of the Clean Water Act, and Section 103 of the Marine Protection Research and Sanctuaries Act of 1972. These laws require that individuals obtain permits that authorize structures and work in or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters prior to undertaking the activity. Information provided in the Joint Permit Application will be used in the permit review process and is a matter of public record once the application is filed. Disclosure of the requested information is voluntary, but it may not be possible to evaluate the permit application or to issue a permit if the information requested is not provided.

CERTIFICATION: I am hereby applying for permits typically issued by the DEQ, VMRC, USACE, and/or Local Wetlands Boards for the activities I have described herein. I agree to allow the duly authorized representatives of any regulatory or advisory agency to enter upon the premises of the project site at reasonable times to inspect and photograph site conditions, both in reviewing a proposal to issue a permit and after permit issuance to determine compliance with the permit.

In addition, I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

ENVIRONMENTAL IMPACT REVISION

9. APPLICANT, AGENT, PROPRTY OWNER, AND CONTRACTOR CERTIFICATIONS (Continued)

Is/Are the Applicant(s) and Owner(s) the same? ☐ *Yes* ☑ *No*

Legal name & title of Applicant Leslie Hartz, Atlantic Coast Pipeline, LLC	Second applicant's legal name & title, if applicable
Applicant's signature	Second applicant's signature
Date 4/3/17	Date
Property owner's legal name, if different from Applicant	Second property owner's legal name, if applicable
Property owner's signature, if different from Applicant	Second property owner's signature
Date	Date

CERTIFICATION OF AUTHORIZATION TO ALLOW AGENT(S) TO ACT ON APPLICANT'S(S') BEHALF (IF APPLICABLE)

I (we), _____ (and) _____,
APPLICANT'S LEGAL NAME(S) – *complete the second blank if more than one Applicant*

hereby certify that I (we) have authorized _____ (and) _____
AGENT'S NAME(S) – *complete the second blank if more than one Agent*

to act on my (our) behalf and take all actions necessary to the processing, issuance, and acceptance of this permit and any and all standard and special conditions attached. I (we) hereby certify that the information submitted in this application is true and accurate to the best of my (our) knowledge.

Applicant's signature	Second applicant's signature, if applicable
Date	Date
Agent's signature and title	Second agent's signature and title, if applicable
Date	Date

CONTRACTOR ACKNOWLEDGEMENT (IF APPLICABLE)

I (we), _____ (and) _____,
APPLICANT'S LEGAL NAME(S) – *complete the second blank if more than one Applicant*

have contracted _____ (and) _____
CONTRACTOR'S NAME(S) – *complete the second blank if more than one Contractor*

to perform the work described in this Joint Permit Application, signed and dated _____.

I (we) will read and abide by all conditions as set forth in all federal, state, and local permits as required for this project. I (we) understand that failure to follow the conditions of the permits may constitute a violation of applicable federal, state, and local statutes and that we will be liable for any civil and/or criminal penalties imposed by these statutes.

In addition, I (we) agree to make available a copy of any permit to any regulatory representative visiting the project site to ensure permit compliance. If I (we) fail to provide the applicable permit upon request, I (we) understand that the representative will have the option of stopping our operation until it has been determined that we have a properly signed and executed permit and are in full compliance with all of the terms and conditions.

Contractor's name or name of firm (printed/typed)	Contractor's or firm's mailing address	
Contractor's signature and title	Contractor's license number	Date
Applicant's signature	Second applicant's signature, if applicable	
Date	Date	

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END OF GENERAL INFORMATION

The following sections are activity-specific. Fill out only the sections that apply to your particular project.

10. PRIVATE PIERS, MARGINAL WHARVES, AND UNCOVERED BOAT LIFTS

*If you plan to construct a private, residential pier, you **may** qualify to work in a non-reporting capacity under the Norfolk District Corps of Engineers' Regional Permit 17 (RP-17). A copy of RP-17 can be obtained by calling (757) 201-7652 or by visiting the USACE's website at: http://www.nao.usace.army.mil/Missions/Regulatory/RPregional.aspx . A copy of the RP-17 Certificate of Compliance is found in Appendix B of this application package. You should only sign and attach this form to the application if you have completely read and understood the terms and conditions of RP-17. **Although no further written authorization will be required from the USACE, you may require a permit from the Virginia Marine Resources Commission and/or your local wetlands board. Please submit this application as instructed in order to obtain all required state and local permits.***

In cases where the proposed pier will encroach beyond one fourth the waterway width (as determined by measuring mean high water to mean high water or ordinary high water mark to ordinary high water mark), the following information must be included before the application will be considered complete. For an application to be considered complete:

1. The USACE **MAY** require depth soundings across the waterway at increments designated by the USACE project manager. Typically 10-foot increments for waterways less than 200 feet wide and 20-foot increments for waterways greater than 200 feet wide with the date and time the measurements were taken and how they were taken (e.g., tape, range finder, etc.).
2. The applicant **MUST** provide a justification as to purpose if the proposed work would extend a pier greater than one-fourth of the distance across the open water measured from mean high water or the channelward edge of the wetlands.
3. The applicant **MUST** provide justification if the proposed work would involve the construction of a pier greater than five feet wide or less than four feet above any wetland substrate.

Number of vessels to be moored at the pier or wharf: _____	Do you have an existing pier on your property? ☐ Yes ☐ No If yes, will it be removed? ☐ Yes ☐ No Is your lot platted to the mean low water shoreline? ☐ Yes ☐ No

In the spaces provided below, give the type (e.g., sail, power, skiff, etc.), size, and registration number of the vessel(s) to be moored

TYPE	LENGTH	WIDTH	DRAFT	REGISTRATION #

11. BOATHOUSES, GAZEBOS, COVERED BOAT LIFTS, AND OTHER ROOFED STRUCTURES OVER WATERWAYS

Number of vessels to be moored at the proposed structure: _____	Will the sides of the structure be enclosed? ☐ Yes ☐ No Area covered by the roof structure _____ square feet

In the spaces provided below, give the type (e.g., sail, power, skiff, etc.), size, and registration number of the vessel(s) to be moored

TYPE	LENGTH	WIDTH	DRAFT	REGISTRATION #

12. MARINAS AND COMMERCIAL, GOVERNMENTAL, AND COMMUNITY PIERS

Have you obtained the Virginia Department of Health's approval for sanitary facilities? ☐ Yes ☐ No
You will need to obtain this authorization or a variance before a VMRC permit will be issued.

Will petroleum products or other hazardous materials be stored or handled at the facility? ☐ Yes ☐ No
If your answer is yes, please attach your spill contingency plan.

Will the facility be equipped to off-load sewage from boats? ☐ Yes ☐ No

EXISTING: wet slips: _____ dry storage: _____	*PROPOSED:* wet slips: _____ dry storage _____

17. DREDGING, MINING, AND EXCAVATING

FILL OUT THE FOLLOWING TABLE FOR DREDGING PROJECTS

	NEW dredging				MAINTENANCE dredging			
	Hydraulic		Mechanical (clamshell, dragline, etc.)		Hydraulic		Mechanical (clamshell, dragline, etc.)	
	Cubic yards	Square feet	Cubic yards	Square feet	Cubic yards	Square feet	Cubic yards	Square feet
Vegetated wetlands								
Non-vegetated wetlands								
Subaqueous land								
Totals								

Is this a one-time dredging event? ☐ Yes ☐ No If "no", how many dredging cycles are anticipated: _____
(____ initial cycle in cu. yds.) (_____ subsequent cycles in cu. yds.)

Composition of material (percentage sand, silt, clay, rock):
Provide documentation (i.e., laboratory results or analytical reports) that *dredged* material from on-site areas is free of toxics. If not free of toxics, provide documentation of proper disposal (i.e., bill of lading from commercial supplier or disposal site).

Please include a dredged material management plan that includes specifics on how the dredged material will be handled and retained to prevent its entry into surface waters or wetlands. If on-site dewatering is proposed, please include plan view and cross-sectional drawings of the dewatering area and associated outfall.

Will the dredged material be used for any commercial purpose or beneficial use? ☐ Yes ☐ No
If yes, please explain:

If this is a maintenance dredging project, what was the date that the dredging was last performed? _____
Permit number of original permit: _____ *(It is important that you attach a copy of the original permit.)*

For mining projects: On separate sheets of paper, explain the operation plans, including: 1) the frequency (e.g., every six weeks), duration (i.e., April through September), and volume (in cubic yards) to be removed per operation; 2) the temporary storage and handling methods of mined material, including the dimensions of the containment berm used for upland disposal of dredged material and the need (or no need) for a liner or impermeable material to prevent the leaching of any identified contaminants into ground water; 3) how equipment will access the mine site; and 4) verification that dredging: a) will not occur in water body segments that are currently on the effective Section 303(d) Total Maximum Daily Load (TMDL) priority list (available at http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/TMDL/TMDLDevelopment/TMDLProgramPriorities.aspx) or that have an approved TMDL; b) will not exacerbate any impairment; and c) will be consistent with any waste load allocation/limit/conditions imposed by an approved TMDL (see, "What's in my backyard" or subsequent spatial files at http://www.deq.virginia.gov/ConnectWithDEQ/VEGIS.aspx to determine the extent of TMDL watersheds and impairment segments).
Have you applied for a permit from the Virginia Department of Mines, Minerals and Energy? ☐ Yes ☐ No If Yes:
Existing permit number:_____ Date permit issued: _____

Contributing drainage area: _____square miles	Average stream flow at site (flow rate under normal rainfall conditions): _____cfs

18. FILL (not associated with backfilled shoreline structures) AND OTHER STRUCTURES (other than piers and boathouses) IN WETLANDS OR WATERS, OR ON DUNES/BEACHES

Source and composition of fill material (percentage sand, silt, clay, rock): Clean fill from a commercial source free of toxics

Provide documentation (i.e., laboratory results or analytical reports) that *fill* material from *off-site* locations is free of toxics. If not free of toxics, provide documentation of proper disposal (i.e., bill of lading from commercial supplier or disposal site). Documentation is not necessary for fill material obtained from on-site areas.

Explain the purpose of the filling activity and the type of structure to be constructed over the filled area (if any):

The filling activity will be to construction a Metering and Regulating (M&R) station.

Describe any structure that will be placed in wetlands/waters or on a beach dune and its purpose:

See Section 3.2 and Appendix F of the Supplemental Information for additional details. Section 3.9.5 contains details of minimization of wetland impacts related to construction of the M&R station.

Will the structure be placed on pilings? ☐ Yes ☑ No	Total area occupied by any structure. 3485 wetland Square Feet
How far will the structure be placed channelward from the back edge of the dune? _____feet	How far will the structure be placed channelward from the back edge of the beach? _____feet

19. NONTIDAL STREAM CHANNEL MODIFICATIONS FOR RESTORATION OR ENHANCMENT, or TEMPORARY OR PERMANENT RELOCATIONS

If proposed activities are being conducted for the purposes of compensatory mitigation, please attach separate sheets of paper providing all information required by the most recent version of the stream assessment methodology approved by the Norfolk District of the U.S. Army Corps of Engineers and the Virginia Department of Environmental Quality, in lieu of completing the questions below. Required information outlined by the methodology can be found at: http://www.nao.usace.army.mil/Missions/Regulatory/UnifiedStreamMethodology.aspx *or* http://www.deq.virginia.gov/Programs/Water/WetlandsStreams/Mitigation.aspx.

For all projects proposing stream restoration provide a completed Natural Channel Design Review Checklist and Selected Morphological Characteristics form. These forms and the associated manual can be located at: https://www.fws.gov/chesapeakebay/StreamReports/NCD%20Review%20Checklist/Natural%20Channel%20Design%20Checklist%20Doc%20V2%20Final%2011-4-11.pdf

Has the stream restoration project been designed by a local, state, or federal agency? ☐ Yes ☐ No. If yes, please include the name of the agency here: _____
Is the agency also providing funding for this project? ☐ Yes ☐ No

Stream dimensions at impact site (length and average width in linear feet, and area in square feet):
L: _____(ft) AW: _____(ft) Area: _____(sq. ft.)

Contributing drainage area: _____acres *or* _____square miles

Existing average stream flow at site (flow rate under normal rainfall conditions): _____cfs	Proposed average stream flow at site after modifications (flow rate under normal rainfall conditions): _____cfs

Explain, in detail, the method to be used to stabilize the banks:

Explain the composition of the existing stream bed (percent cobble, rock, sand, etc.):

19. NONTIDAL STREAM CHANNEL MODIFICATIONS FOR RESTORATION OR ENHANCMENT, or TEMPORARY OR PERMANENT RELOCATIONS (Continued)

Will low-flow channels be maintained in the modified stream channel? [ ] Yes [ ] No.
Describe how:

Will any structure(s) be placed in the stream to create riffles, pools, meanders, etc.? [ ] Yes [ ] No
If yes, please explain:

20. UTILITY CROSSINGS

Type of crossing: ____ overhead * ____ trenched * ____ directionally-drilled

Method of clearing corridor of vegetation (check all that apply): [■] mechanized land clearing that disturbs the soil surface
[■] cutting vegetation above the soil surface

Describe the materials to be used in the installation of the utility line (including gravel bedding for trenched installations, bentonite slurries used during direction-drilling, etc.) and a sequence of events to detail how the installation will be accomplished (including methods used for in-stream and dry crossings).

See Section 3.7 and Section 20.0 of the Supplemental Information.

Will the proposed utility provide empty conduits for any additional utilities that may propose to co-locate at a later date? [ ] Yes
[✓] No.

For overhead crossings over navigable waterways (including all tidal waterways), please indicate the height of other overhead crossings or bridges over the waterway relative to mean high water, mean low water, or ordinary high water mark:

N/A

Nominal system voltage, if project involves power lines: N/A

Total number of electrical circuits: _____

Will there be an excess of excavated material? [✓] Yes [ ] No
If so, describe the method that will be undertaken to dispose of, and transport, the material to its permanent disposal location and give that location:

Vegetation and woody debris will be removed from wetland and waterbody areas and disposed of in upland areas. Pre-construction contours will be restored in wetlands; waterbody beds and banks will be restored to pre-construction contours. See Section 20.0 of the Supplemental Information for additional details on material disposal. See Section 3.8 of Supplemental Information for details on temporary stockpiling. Pre-construction contours will be restored.

Will any excess material be stockpiled in wetlands? [✓] Yes [ ] No
If so, will the stockpiled material be placed on filter fabric or some other type of impervious surface? [✓] Yes [ ] No

Will permanent access roads be placed through wetlands/streams? [✓] Yes [ ] No
If yes, will the roads be (check one) [ ] at grade [■] above grade ?

Will the utility line through wetlands/waters be continually maintained (e.g. via mowing or herbicide)? [✓] Yes [ ] No
If maintained, what is the maximum width? 10 feet

21. ROAD CROSSINGS

Have you conducted hydraulic studies to verify the adequacy of the culverts? ☐ Yes ☑ No
If so, please attach a copy of the hydraulic study/report.
Virginia Department of Transportation (VDOT) standards require that the backwater for a 100 year storm not exceed 1 foot for all road, culvert, and bridge projects within FEMA-designated floodplains. Virginia Department of Environmental Quality (DEQ) requires pipes and culverts 24 inches or less in diameter to be countersunk three inches below the natural stream bed elevations, and pipes and culverts greater than 24 inches to be countersunk at least six inches below the natural stream bed elevations. Hydraulic capacity is determined based on the reduced capacity due to the countersunk position.

Will the culverts be countersunk below the stream bottom? ☑ Yes ☐ No. If no, explain: _____

If the project entails a bridged crossing and there are similar crossings in the area, what is the vertical distance above mean high water, mean low water, or ordinary high water mark of those similar structures? Temporary Bridges Only feet above _____
For all bridges proposed over navigable waterways (including all tidal water bodies), you will be required to contact the U.S. Coast Guard to determine if a permit is required of their agency.

On separate sheets of paper, describe the materials to be used, the method of construction (including the use of cofferdams), the sequence of construction events, and if bedrock conditions may be encountered. Include cross-sections and profile plans of the culvert crossings including wing walls or rip rap.

22. IMPOUNDMENTS, DAMS, AND STORMWATER MANAGEMENT FACILITIES
If the impoundment or dam is a component of a water withdrawal project, also complete Sections 24 through 26.

Will the proposed impoundment, dam, or stormwater management facility be used for agricultural purposes (e.g., in the operation of a farm)? For DEQ permitting purposes, a farm is considered to be a property or operation that produces goods for market.
☐ Yes ☐ No

What type of materials will be used in the construction (earth, concrete, rock, etc.)? _____

What is the source of these materials? _____

Provide the dimensions of proposed impoundment, dam, or stormwater management facility, including the height and width of all structures.

Storage capacity* of impoundment: _____acre-feet *should be given for the normal pool of recreational or farm ponds, or design pool for stormwater management ponds or reservoirs (the elevation the pond will be at for the design storm, e.g., 10-year, 24-hour storm)	Surface area** of impoundment: _____acres **should be given for the normal pool of recreational or farm ponds, or design pool for stormwater management ponds or reservoirs (the elevation the pond will be at for the design storm, e.g., 10-year, 24-hour storm)

Is the proposed project excluded from the Virginia Dam Safety Regulations? ☐ Yes ☐ No ☐ Uncertain

If not excluded, does your proposed project comply with the Virginia Dam Safety Regulations? ☐ Yes ☐ No ☐ Uncertain

Does the proposed design include a vegetation management area per §10.1-609.2? ☐ Yes ☐ No ☐ Uncertain

If your answer to these questions is no or uncertain, you should contact the Virginia Department of Conservation and Recreation's Dam Safety Program at (804) 371-6095, or reference the regulations on the Web at
http://www.dcr.virginia.gov/dam_safety_and_floodplains/index.shtml

For stormwater management and flood control facilities:
Design storm event: _____year storm
Retention time: _____hours
Current average flow (flow rate under normal rainfall conditions): _____cfs Method used to derive average flow: _____
Proposed peak outflow for the design storm provided above: _____cfs

Has the facility been designed as an Enhanced Extended Detention Basin or an Extended Detention Basin in accordance with the Minimum Standard 3.07 of the Virginia Stormwater Management Handbook, Volume I (published by the Virginia Department of Conservation and Recreation, 1999), or in accordance with the latest version of this handbook? ☐ Yes ☐ No

Will the impoundment structure be designed to pass a minimum flow at all times? ☐ Yes ☐ No
If so, please give the minimum rate of flow: _____cfs

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22. IMPOUNDMENTS, DAMS, AND STORMWATER MANAGEMENT FACILITIES (Continued)

What is the drainage area upstream of the proposed impoundment? _____square miles

How much of your proposed impoundment structure will be located on the stream bed? _____square feet

What is the area of vegetated wetlands that will be excavated and/or back-flooded by the impoundment? _____ square feet

What is the *area and length* of streambed that will be excavated and/or back-flooded by the impoundment? _____ square feet
_____ linear feet

Are fish ladders being proposed to accommodate the passage of fish? ☐ Yes ☐ No

23. OUTFALLS NOT ASSOCIATED WITH PROPOSED WATER WITHDRAWAL ACTIVITIES

Type and size of pipe(s): _____
Daily rate of discharge: _____mgd
If the discharge will be thermally-altered, provide the maximum temperature: _____
Contributing drainage area: _____square miles Average daily stream flow at site: _____cfs

Have you received a Virginia Discharge Elimination System (VPDES) permit for the proposed project? ☐ Yes ☐ No.
If yes, please provide the VPDES permit number: _____.
If no, is there a permit action pending? ☐ Yes ☐ No. If pending, what is the facility name? _____.

The following sections are typically related to surface water withdrawal activities; Federal Energy Regulatory Commission license projects; or impacts likely to require instream flow limits. Examples of such projects include, but are not limited to, reservoirs, irrigation projects, power generation facilities, and public water supply facilities that may or may not have associated features, such as dams, intake pipes, outfall structures, berms, etc.

If completing these sections, enter "N/A" in any section that does not apply to the project.

24. INTAKES, OUTFALLS, AND WATER CONTROL STRUCTURES (INCLUDING ALL PROPOSED WATER WITHDRAWAL ACTIVITIES)

For intakes:

Type and size of pipe(s): See Section 24.0 for responses

Type and size of pump(s): to questions in this section

Average and Maximum daily rate of withdrawal: _____

and _____mgd

Velocity of withdrawal: 0.25 fps

Screen mesh size: _____inches / 1 mm

If other sizing units, please specify: _____

Contributing drainage area at withdrawal point(s):

_____square miles

Average daily stream flow at withdrawal point(s) (flow rate under normal rainfall conditions): _____cfs

Method(s) used to derive average daily stream flow

_____

_____

Average annual stream flow at withdrawal point(s):

_____cfs

Latitude and longitude of withdrawal point(s) (degrees, minutes, seconds): _____

For outfalls:

Type, size, and hydraulic capacity (under normal conditions) of pipe(s): N/A _____, _____, and _____

Daily rate of discharge: N/A _____mgd

If the discharge will be thermally-altered, provide the maximum temperature: _____

Contributing drainage area at discharge point(s):

_____square miles

Average daily stream flow at discharge point(s) (flow rate under normal rainfall conditions): _____cfs

Method(s) used to derive average daily stream flow

_____

_____

Latitude and longitude of discharge point(s) (degrees, minutes, seconds): _____

For intakes and dams, use the table below to provide the median monthly stream flows in cubic feet per second (cfs) at the water intake or dam site (not at the stream gage; if there is not a gage at the intake or dam site, you will need to interpolate flows to the intake or dam site based upon the most closely related watershed in which there is an operational stream gage monitored by the United States Geologic Survey (USGS)). Median flow is the value at which half of the measurements are above and half of the measurements are below. Median is also sometimes referred to as the '50% exceedence flow'. The median flow generally must be calculated from USGS historical data. Please do not provide *mean (average)* flow.

Month	Median flow (cfs)	Month	Median flow (cfs)
January	See Section 24.0	July	
February		August	
March		September	
April		October	
May		November	
June		December	

Describe the stream flow gages used, USGS stream flow gage site number and site name (e.g., USGS 01671100 Little River near Doswell, VA), the type of calculations used (such as drainage area correction factors), and the period of record that was used to calculate the median flows provided in the table above. Generally, the period of record should span a minimum of 30 years.

See Section 24.0

24. INTAKES, OUTFALLS, AND WATER CONTROL STRUCTURES (Continued)

For interbasin transfer of water resources proposed from either the Chowan River, New River, Potomac River, Roanoke River, Big Sandy River, or Tennessee River basins to another river basin, provide the following information:

Destination location (discharge point) of the transfer:
8-digit USGS Hydrologic Unit Code (HUC) (See http://cfpub.epa.gov/surf/locate/index.cfm): _____
If known, indicate the 10-digit and 12-digit USGS HUCs (see http://dswcapps.dcr.virginia.gov/htdocs/maps/HUExplorer.htm):
_____ _____

Latitude and Longitude: _____° _____' _____" / _____° _____' _____"

Provide any available historical low-flows at the intake or dam site.

N/A

Describe how the proposed withdrawal at the intake or dam site will impact stream flows in terms of rates, volumes, frequency, etc. (e.g., percent of the flow to be withdrawn, percent of withdrawal returned to the original source, etc.).

See Section 24.0

Describe how the withdrawal of water will vary over time. For example, will the withdrawal vary by the time of year, by the time of day, or by the time of week? Examples of projects that should describe variable withdrawals include, but are not limited to: power plant cooling withdrawals that increase and decrease seasonally; golf course irrigation; municipal water supply; nurseries; ski resorts that use water for snowmaking; and resorts with weekend or seasonal variations.

See Section 24.0

Provide the amount of water that will be lost due to consumptive use. For the purpose of this application, consumptive use means the withdrawal of surface waters without recycling of said waters to their source or basin of origin. Examples of consumptive uses are water that is evaporated in cooling towers or by other means in power plants; irrigation water (all types); residential water use that takes place outside of the home; and residential water use both inside and outside of homes for residences served by septic systems. Projects that propose a transfer of water from one river basin to another and/or localities that sell water to other jurisdictions, should document the portion of the withdrawal that is not returned to the originating watershed.

Proposed monthly consumptive volume (million gallons): Fugitive Dust Control Water Will be Consumptive

Attach a map showing the *location* of the withdrawal and of the return of flow, and provide the *amount* of the return flow (million gallons).

24. INTAKES, OUTFALLS, AND WATER CONTROL STRUCTURES (Continued)

For withdrawals proposed on an impoundment, provide a description of flow or release control structures. Include type of structure, rate of flow, size, capacity, invert elevation of outfall pipes referenced to the normal pool elevation, and the mechanism used to control release. Provide a description of available water storage facilities. Include the volume, depth, normal pool elevation, unusable storage volume and dimensions. If applicable, stage-storage relationship at the impounding structure (the volume of water in the impoundment at varying stages of water depth) and volume or rate of withdrawals from the storage facility.

See Section 24.0 for additional details. Atlantic will submit a Water Use Plan to VDEQ later summer 2017.

25. WATER WITHDRAWAL USE(S), NEED, AND ALTERNATIVES *(Attach additional sheets if needed.)*

Describe the proposed use(s) and need for the surface water and information on how demand for surface water was determined. *Golf courses* must provide documentation to justify the amount of water withdrawal, such as the amount of acreage under irrigation, the acreage of fairways versus greens, type of turf grass, evapotranspiration, and irrigation efficiency. *Agricultural* users must supply documentation justifying their requested withdrawal amount, such as type of crop, livestock, or other agriculture animal, number of animals, watering needs, acres irrigated, inches of water applied, and frequency of application. *Other users* of withdrawals for purposes other than those described above must provide sufficient documentation to justify the requested withdrawal amounts.

Water withdrawals for ACP cover HDD drill mud, fugitive dust control, and hydrostatic testing. See Section 25.0 of the Supplemental Information for additional details.

Provide the following information at the water intake or dam site. Specify the units of measurement (e.g., million gallons per day, gallons per minute, cubic feet per second, etc.).

Proposed maximum instantaneous withdrawal 3,000 gallons per minutes (gpm)
Proposed average daily withdrawal Atlantic will provide a Water Use Plan to VDEQ later summer 2017.
Proposed maximum daily withdrawal
Proposed maximum monthly withdrawal
Proposed maximum annual withdrawal

Describe how the above withdrawals were calculated, including the relevant assumptions made in that calculation and the documentation or resources used to support the calculations, such as population projections, population growth rates, per-capita use, new uses, changes to service areas, and if applicable, evapotranspiration data and irrigation data.

The average daily withdrawal will typically occur between 1,500 to 3,000 gpm but will not exceed 10% of the waterbody's discharge (as measured at the nearest upstream USGS gauging station). More information is provided in Section 25.0 of the Supplemental Document, and a Water Use Plan will be submitted to VDEQ late summer 2017.

25. WATER WITHDRAWAL USE(S), NEED, AND ALTERNATIVES (Continued)

For surface water withdrawals, public water supply withdrawals, and projects that will alter instream flows, provide information to establish the local water supply need. Attach additional sheets if needed.

EXISTING	PROJECTED
Existing supply sources, yields, and demands:	Projected demands over a minimum 30-year planning period:
Peak day withdrawal:	Projected demands in local or regional water supply plan (9VAC25-780 et seq.) or demand for the project service area, if that is smaller in area:
Average daily withdrawal:	
Safe yield:	Statistical population (growth) trends:
Lowest daily flow of record:	
Types of water uses (residential, public water supply, commercial, industrial, agricultural):	Projected demands by type of water use:
Existing water conservation measures and drought response plan, including what conditions trigger implementation:	Projected demands without water conservation measures:
	Projected demands with long-term water conservation measures:

For surface water withdrawals other than public water supply, provide information or documentation that demonstrates alternate sources of water are available for the proposed project during times of reduced instream flow.

See information in Section 25.0 of the Supplemental Information and Atlantic will submit a Water Use Plan to VDEQ in late summer 2017.

Provide information from the State Water Resources Plan (http://www.deq.virginia.gov/Programs/Water/WaterSupplyWaterQuantity/WaterSupplyPlanning/StateWaterResourcesPlan.aspx) and the local or regional water supply plan that covers the area in which the proposed water withdrawal project is located (http://www.deq.virginia.gov/Portals/0/DEQ/Water/WaterSupplyPlanning/SWRP%20Final/App%20A%20Water%20Supply%20Plans%20and%20Participating%20Localities.pdf). Include information from the plan that pertains to projected demand, analysis of alternatives, and water conservation measures. Discuss any discrepancies between the water supply plan and the proposed project. For projects that propose a transfer of water resources from the Chowan River, New River, Potomac River, Roanoke River, Big Sandy River, or Tennessee River basins to another river basin, information should be provided from the water supply plans for both the source and receiving basins. Attach additional sheets if needed.

N/A water use will be short term and lower volumes for hydrostatic testing, HDD drill mud, and fugitive dust control.

Provide an alternatives analysis for the proposed water withdrawal project, including the required range of alternatives to be analyzed; a narrative outlining the opportunities and status of regional efforts undertaken; and the criteria used to evaluate each alternative. The analysis must address all of the criteria contained in 9VAC25-360.

N/A water use will be short term and lower volumes for hydrostatic testing, HDD drill mud, and fugitive dust control.

25. WATER WITHDRAWAL USE(S), NEED, AND ALTERNATIVES (Continued)

Describe any existing, flow-dependent beneficial uses along the affected stream reach. Include both instream and offstream uses. Describe the stream flow necessary to protect existing beneficial uses, how the proposed withdrawal will impact existing beneficial uses, and any measures proposed to mitigate any adverse impacts that may arise. For projects that propose a transfer of water resources from the Chowan River, New River, Potomac River, Roanoke River, Big Sandy River, or Tennessee River basins to another river basin, this analysis should include both the source and receiving basins. For the purposes of this application, beneficial instream uses include, but are not limited to, the protection of fish and wildlife habitat; maintenance of waste assimilation; recreation; navigation; and cultural and aesthetic values. Offstream beneficial uses include, but are not limited to, domestic uses (including public water supply); agricultural uses; electric power generation; commercial uses; and industrial uses.

N/A water use will be short term and lower volumes for hydrostatic testing, HDD drill mud, and fugitive dust control.

Describe the aquatic life known to be present along the affected stream reach. Describe aquatic life that may be impacted by the proposed water withdrawal. Include the species' habitat requirements. For projects that propose a transfer of water resources from either the Chowan River, New River, Potomac River, Roanoke River, Big Sandy River, or Tennessee River basins to another river basin, this analysis should include both the source and receiving basins.

Atlantic will adhere to time of year restrictions according to the final Biological Assessment for the Project.

26. PUBLIC COMMENTS/ISSUES FOR MAJOR WATER WITHDRAWALS OR INTERBASIN TRANSFERS

For new or expanded surface water supply projects, use separate sheets of paper to summarize the steps taken to seek public input per 9VAC25-210-320, and identify the issues raised during the public information process.

For transfer of water resources proposed from either the Chowan River, New River, Potomac River, Roanoke River, Big Sandy River, or Tennessee River basins to another river basin, if public input was not required per 9VAC25-210-320, summarize on separate sheets of paper any coordination and/or notice provided to the public, local/state government, and interested parties in the affected river basins and identify any issues raised.

Atlantic Coast Pipeline

ATLANTIC COAST PIPELINE

Joint Permit Application:

United States Army Corps of Engineers – Norfolk District, Virginia Department of Environmental Quality, and Virginia Marine Resources Commission

SUPPLEMENTAL INFORMATION

Prepared by

ERM

July 2017

RECEIVED
JUL 20 2017
MARINE RESOURCES COMMISSION

ADDITIONAL INFO
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Atlantic Coast Pipeline Project
Joint Permit Application
U.S. Army Corps of Engineers – Norfolk District

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LIST OF ACRONYMS AND ABBREVIATIONS

ACP	Atlantic Coast Pipeline
ACUB	Army Compatible Use Buffer
APE	Area of Potential Effect
Atlantic	Atlantic Coast Pipeline, LLC
ATWS	additional temporary workspace
BA	biological assessment
bcf/d	billion cubic feet per day
CBPA	Chesapeake Bay Preservation Act
CFR	Code of Federal Regulations
CWA	Clean Water Act
DOE	U.S. Department of Energy
Dominion Energy	Dominion Energy, Inc.
DETI	Dominion Energy Transmission, Inc.
DVP	Dominion Virginia Power
EFH	Essential Fish Habitat
EIA	U.S. Energy Information Administration
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ESFO	Fish and Wildlife Service Ecological Services Field Office
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FR	Federal Register
FWS	U.S. Fish and Wildlife Service
GDS-NWR	Great Dismal Swamp National Wildlife Refuge
GIS	geographic information system
GWNF	George Washington National Forest
HDD Plan	Horizontal Directional Drill Fluid Monitoring, Operations, and Contingency Plan
HDD	Horizontal Directional Drill
HUC	Hydrologic Unit Code
IPaC System	Information, Planning, and Conservation System
JPA	Standard Joint Permit Application
M&R	metering and regulating
MBTA	Migratory Bird Treaty Act
MNF	Monongahela National Forest
MP	milepost
NAO	USACE – Norfolk District
NEPA	National Environmental Policy Act
NHI	National Heritage Inventory
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NWP	Nationwide Permit
PEM	Palustrine System Emergent Wetland Class
PFO	Palustrine System Forested Wetland Class

Plan	*Upland Erosion Control, Revegetation, and Maintenance Plan*
PRM	permittee responsible mitigation
Procedures	*Wetland and Waterbody Construction and Mitigation Procedures*
Project	Atlantic Coast Pipeline
PSS	Palustrine System Scrub-Shrub Wetland Class
SHP	Supply Header Project
SPCC	Spill Prevention, Control, and Countermeasures Plan
TNC	The Nature Conservancy
Transco	Transcontinental Gas Pipe Line Company, LLC
USACE	United States Army Corps of Engineers
USFS	U.S. Forest Service
USGS	United States Geological Survey
VAC	Virginia Administrative Code
VDCR	Virginia Department of Conservation and Recreation
VDEQ	Virginia Department of Environmental Quality
VDGIF	Virginia Department of Game and Inland Fisheries
VMRC	Virginia Marine Resources Commission
VOF	Virginia Outdoors Foundation
WBWF	Virginia Army National Guard and the Ward Burton Wildlife Foundation
WMA	Wildlife Management Area

APPLICATION SUPPLEMENTAL INFORMATION DESIGN

Section numbering has been incorporated into this supplemental information document to match the appropriate section of the Standard Joint Permit Application (JPA) (REVISED: April 2017) in the Commonwealth of Virginia used jointly by the U.S. Army Corps of Engineers (USACE), Virginia Marine Resources Commission (VMRC), and Virginia Department of Environmental Quality (VDEQ). Any omitted section numbers would correspond to sections of the JPA that are not applicable to the Atlantic Coast Pipeline (ACP). The ACP is a Federal Energy Regulatory Commission (FERC) 7c regulated project and the USACE has agreed to participate in FERC's National Environmental Policy Act (NEPA) process as a cooperating agency.

INTRODUCTION

Atlantic Coast Pipeline, LLC (Atlantic) is a company formed by four major U.S. energy companies—Dominion Energy, Inc. (Dominion Energy); Duke Energy Corporation; Piedmont Natural Gas Co., Inc.; and Southern Company Gas, Inc. The company was created to develop, own, and operate the proposed Atlantic Coast Pipeline (ACP or Project), an 604.6 mile-long interstate natural gas transmission pipeline system designed to meet growing energy needs in Virginia and North Carolina (see Appendix A, figure A-1). The ACP will be capable of delivering up to 1.5 million dekatherms per day of natural gas that will be used to generate electricity, heat homes, and run local businesses. By providing access to additional low-cost natural gas supplies in Virginia and North Carolina, the Project will facilitate cleaner air, increase the reliability and security of natural gas supplies, and provide a significant economic boost in West Virginia, Virginia, and North Carolina. More information is provided at the company's website at www.dom.com/acpipeline. Atlantic has contracted with Dominion Energy Transmission, Inc. (DETI), a subsidiary of Dominion, to permit, build, and operate the ACP on behalf of Atlantic.

In addition to applications to USACE for verification under Nationwide Permit (NWP) 12 for the proposed ACP in West Virginia, Virginia, and North Carolina, DETI has applied for verification/authorization for the Supply Header Project (SHP) under the Pennsylvania State Programmatic General Permit-5 (PASPGP-5) in conjunction with the Pennsylvania Department of Environmental Protection Chapter 105 General Permit for Project proposed impacts to the waters of the U.S and for structures or work in navigable Waters of the U.S. within Pennsylvania. The PASPGP-5 was issued pursuant to Section 404(e) of the Clean Water Act (CWA) and is based upon and consistent with the requirements of the Clean Water Act Section 404(b)(1) Guidelines. The USACE administers the PASPGP-5 jointly with the Pennsylvania Department of Environmental Protection to authorize the placement of discharge of dredged and/or fill material into Waters of the U.S. under the provisions of Section 404 of the CWA and for structures or work in or affecting navigable Waters of the U.S. under the provisions of Section 10 of the Rivers and Harbors Act of 1899. DETI has also applied to USACE Pittsburgh District for verification under NWP 12 for proposed SHP work in West Virginia within Pittsburgh District Regulatory boundaries; and to USACE Wilmington District for verification under NWP 12 for proposed SHP work in North Carolina within Wilmington District Regulatory boundaries.

Atlantic has prepared the following supplemental information document for the ACP Project proposed work in Virginia to accompany the JPA form used by the USACE, VMRC, VDEQ, and the Local Wetlands Boards for permitting purposes involving water, wetlands, and dune/beach resources, including, but not limited to, *major* water supply and water withdrawals projects (as defined in VDEQ Regulation 9 Virginia Administrative Code [VAC] 25-210).

Request for USACE NWP 12 for Single and Complete Crossings of Waters of the U.S.

Atlantic is providing information as background regarding the ACP to assist the USACE in understanding the overall project being permitted and authorized through FERC. Atlantic understands that the USACE is a cooperating agency on the NEPA evaluation being conducted by FERC, including preparation of an environmental impact statement (EIS), but provides the following information to the USACE to provide context and understanding regarding the location of the multiple single and complete projects (crossings) proposed for verification under NWP 12. The background information provided from the FERC process is intended to assist the USACE in determining that verification of each of the single and complete projects (crossings) proposed as a part of this linear project under NWP 12 is appropriate and fully consistent with USACE regulations on scope of analysis and the NWP Program.

In particular, this background information is intended to provide the necessary basis for the USACE to determine that the avoidance and minimization of impacts to Waters of the U.S., as well as mitigation for unavoidable conversion of forested wetlands to scrub-shrub and/or emergent wetlands, for 0.08 acre of wetland loss as a result of one metering and regulating (M&R) station, and 0.96 acres of wetland loss as a result of permanent access road construction and improvements results in no more than minimal impact at each single and complete project (crossing).

Furthermore, the information provided below demonstrates that the cumulative impacts to Waters of the U.S., after considering mitigation (avoiding, minimizing, rectifying, reducing, or compensating for resource losses)consistent with the USACE NWP Program, are no more than minimal based on evaluating impacts within 8-digit Hydrologic Unit Code (HUC 8) watersheds.

Contextual information is provided in this supplement on the overall project to provide a basis for the USACE's no more than minimal impact determinations, understanding that the USACE's scope of analysis under the NWP 12 is limited to the single and complete crossings and the uplands in the immediate vicinity of the single and complete crossings that impact the location of such crossings of Waters of the U.S. Approximately 14 percent of the overall pipeline length of 604.6 miles crossing West Virginia, Virginia, and North Carolina is located within Waters of the U.S. Additional details on these single and complete crossings can be found in the figures in Appendix A; waterbody and wetland tables in Appendix B, and site-specific construction plans for Section 10 navigable waters in Appendix C. A table outlining compliance with each of the regional and general conditions related to NWP 12 is included in Appendix D.

Under relevant USACE precedent (including without limitation, USACE regulations, NEPA implementation procedures, 2017 NWPs Program and Memorandum of Understanding with FERC), the "build/no build" decision and the overall project alignment are determined

through the FERC NEPA process. The USACE serves as a cooperating agency on the FERC EIS through which the USACE can coordinate with FERC to determine that the overall pipeline alignment properly considers avoidance of impacts to Waters of the U.S. Moreover, the FERC licensing process includes a number of required policies and procedures designed to confirm that impacts to waters of the U.S are avoided and minimized to the extent practicable. Section 3.9 Route Alternatives provides a summary of the extensive avoidance and minimization that has occurred to date for the proposed project.

As with any linear project, waters of the U.S cannot be completely avoided because of the extensive and reticulated nature of the aquatic resource. The USACE evaluation under NWP 12 ensures that the unavoidable impacts to waters of the U.S at each single and complete crossing are mitigated in order to ensure no more than minimal individual and cumulative impacts to waters of the U.S, after considering compensatory mitigation for unavoidable impacts. Atlantic has worked with the USACE field staff to provide additional minor adjustments of the pipeline route to avoid waters of the U.S with special ecological value, or where feasible.

Previous Actions Related to the Proposed Work – Coordination, Site Visits, and/or Permits

Atlantic initiated coordination with Federal and Commonwealth agencies as early as the summer of 2015. Numerous coordination meetings have occurred, and initial application submittals made in September 2015, as Table 1-1 documents. As the table documents, Atlantic has submitted an application to the FERC as the Project is a FERC 7c project, and is currently awaiting the completion of the FERC NEPA review, anticipating a final EIS in July 2017. In addition, Atlantic has coordinated closely with the USACE – Norfolk District (NAO) to review water resource boundaries documented by Project field crews, as documented in Table 1-2. Atlantic has received permits to survey on federal lands in the Monongahela National Forest (MNF) and the George Washington National Forest (GWNF); other environmental permit applications are in various stages of submittal and review as noted in Table 1-1, which includes a list of permits required for ACP and anticipated filing and approval dates based on the ACP project schedule. Dates included in Table 1-1 reflect anticipated the permit schedule filed with FERC on May 8, 2017 and have not been updated.

TABLE 1-1

Permit Table for the Atlantic Coast Pipeline (As Filed with FERC May 2017 and Not Updated)

Agency	Permit/Approval/Consultation	Initial Submittal Data *(Anticipated)*	Receipt Date *(as anticipated by the applicant)*
Federal			
Federal Energy Regulatory Commission	Certificate of Public Convenience and Necessity under Section 7(c) of the Natural Gas Act	September 18, 2015	*September 2017*
Federal Aviation Administration	Notice of Proposed Construction or Authorization	November 2016	*October 2017*
Federal Aviation Administration	Supplemental Notice	November 2016	*October 2017*
Federal Communications Commission	Application for Wireless Telecommunications Bureau Radio Service Authority	November 2016	*October 2017*
National Oceanic and Atmospheric Administration – National Marine Fisheries Service	Consultation under Section 7 of the Endangered Species Act and Section 305 of the Magnuson-Stevens Act	Ongoing	*September 2017*
National Oceanic and Atmospheric Administration – National Marine Fisheries Service	Consultation under the Marine Mammal Protection Act	August 2014	*July 2016*

TABLE 1-1

Permit Table for the Atlantic Coast Pipeline (As Filed with FERC May 2017 and Not Updated)

Agency	Permit/Approval/Consultation	Initial Submittal Data *(Anticipated)*	Receipt Date *(as anticipated by the applicant)*
National Park Service – Blue Ridge Parkway	Right-of-Way Grant and Special Use Permit to cross the Blue Ridge Parkway	September 2015	*September 2017*
U.S. Army Corps of Engineers – Pittsburgh, Pittsburgh, Norfolk, and Wilmington Districts	Department of the Army NWP 12 verification under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act	September 2015	*September 2017*
U.S. Army Corps of Engineers – Norfolk District	Department of the Army Permission under Section 408 of the Rivers and Harbors Act	August 2016	*September 2017*
U.S. Army Corps of Engineers – Wilmington District	Department of the Army Permission under Section 408 of the Rivers and Harbors Act	August 2016	*September 2017*
U.S. Fish and Wildlife Service – West Virginia, Virginia, and North Carolina Ecological Field Services Offices	Consultation under Section 7 of the Endangered Species Act	Ongoing January 2017 (updated draft BA submitted)	*September 2017*
U.S. Forest Service – George Washington National Forest and the Appalachian National Scenic Trail	Special Use Permit and Concurrence in Right-of-Way Grant to cross the George Washington National Forest and Appalachian National Scenic Trail as well as related amendments to Land and Resource Management Plan (if required)	November 2015 June 2016 (updated application)	*September 2017*
U.S. Forest Service – Monongahela National Forest	Special Use Permit and Concurrence in Right-of-Way Grant to cross the Monongahela National Forest and as well as related amendments to Land and Resource Management Plan (if required)	November 2015 June 2016 (updated application)	*September 2017*
Virginia			
Virginia Department of Conservation and Recreation	Protected Species Consultation (plant species)	Ongoing	*3Q 2017*
Virginia Department of Conservation and Recreation	Virginia Scenic Rivers Coordination	July 2015	*3Q 2017*
Virginia Department of Environmental Quality – Coastal Zone Management Program	Consistency Determination under the Virginia Coastal Zone Management Program	September 2015 (updated application submitted February 10, 2017)	June 2017
Virginia Department of Environmental Quality – Air Division	Air Permit – New Source Review Permit (or other applicable permit) for Compressor Station 2	September 2015 July 2017 (updated application)	*September2017*
Virginia Department of Environmental Quality – Water Division	General Water Quality Certificate for NWP 12 under Section 401 of the Clean Water Act (Joint Permit Application for the Water Quality Certificate, Virginia Water Protection Permit, River and Stream Crossing Permit, Department of the Army Permit, Submerged Lands Permit, and Tidal Wetland Permit)	September 2015	*3Q 2017*
Virginia Department of Environmental Quality – Water Division	Virginia Water Protection Permit (Joint Permit Application for the Water Quality Certificate, Virginia Water Protection Permit, River and Stream Crossing Permit, Department of the Army Permit, Submerged Lands Permit, and Tidal Wetland Permit)	September 2015	*3Q 2017*
Virginia Department of Environmental Quality – Water Division	General Permit for Discharges from Petroleum Contaminated Sites, Groundwater Remediation, and Hydrostatic Tests (VAG83)	*2Q2Q 2018*	*3Q 20182018*
Virginia Department of Environmental Quality – Water Division	Soil and Erosion Plan and Variance for Open Trench Length	*July 2017*	*4Q 2017*
Virginia Department of Game and Inland Fisheries	Natural Heritage/Protected Species Consultation (wildlife and aquatic species)	Ongoing	*3Q 2017*
Virginia Department of Historical Resources	Consultation under Section 106 of the National Historic Preservation Act	Ongoing	*3Q 2017*

TABLE 1-1

Permit Table for the Atlantic Coast Pipeline (As Filed with FERC May 2017 and Not Updated)

Agency	Permit/Approval/Consultation	Initial Submittal Data *(Anticipated)*	Receipt Date *(as anticipated by the applicant)*
Virginia Department of Transportation	Land Use Permit	2Q 2017 – 3Q 2017	*3Q 2017 – 1Q 2018*
Virginia Marine Resources Commission	Submerged Lands Permit (Joint Permit Application for the Water Quality Certificate, Virginia Water Protection Permit, River and Stream Crossing Permit, Department of the Army Permit, Submerged Lands Permit, and Tidal Wetland Permit)	September 2015	*3Q 2017*
Local Wetland Boards	Tidal Wetland Permit (Joint Permit Application for the Water Quality Certificate, Virginia Water Protection Permit, River and Stream Crossing Permit, Department of the Army Permit, Submerged Lands Permit, and Tidal Wetland Permit)	September 2015	*3Q 2017*
County/City/Local	Floodplain Permit (expected to be required in all Counties and Cities along the routes)	2Q 2017 – 3Q 2017	*2Q 2017 – 3Q 2017*
County/City/Local	Special or Conditional Use Permit (where required)	*2Q 2017*	*3Q 2017*

The VDEQ issued a Request for Information on May 26, 2017 concerning the need for additional review of potential impacts to water quality due to upland activities as part of the Section 401 Water Quality Certification process. Atlantic has provided additional information to VDEQ and continues to work with the agency to address issues related to Section 401 Certification.

In addition, Atlantic has been working with the counties to ensure that they are meeting all of the requirements for the county floodplain regulations. Construction for the Project will be divided into spreads with some spreads beginning construction in 2018 and some spreads beginning construction in 2019. Depending on the construction schedule and county requirements, Atlantic will submit floodplain permits to the counties approximately one to two months prior to the beginning of right-of-way clearing. This will give the counties ample time to review and approve the floodplain permits.

The Chesapeake Bay Preservation Act (CBPA) was enacted to protect, preserve, and improve the waters of the Chesapeake Bay and its tributaries. The CBPA is implemented through the Chesapeake Bay Preservation Area Designation and Management Regulations (9 VAC 25-830 et seq.) which requires localities within Tidewater Virginia[1] to enact ordinances to implement and enforce the requirements of the CBPA. In addition, any locality not included within Tidewater Virginia may elect to incorporate CBPA requirements into its local ordinances. The ACP crosses two localities with local CBPA ordinances, the City of Chesapeake and the City of Suffolk.

[1] In accordance with §62.1-44.15:68 of the CBPA, "Tidewater Virginia" means the following jurisdictions: The Counties of Accomack, Arlington, Caroline, Charles City, Chesterfield, Essex, Fairfax, Gloucester, Hanover, Henrico, Isle of Wight, James City, King and Queen, King George, King William, Lancaster, Mathews, Middlesex, New Kent, Northampton, Northumberland, Prince George, Prince William, Richmond, Spotsylvania, Stafford, Surry, Westmoreland, and York, and the Cities of Alexandria, Chesapeake, Colonial Heights, Fairfax, Falls Church, Fredericksburg, Hampton, Hopewell, Newport News, Norfolk, Petersburg, Poquoson, Portsmouth, Richmond, Suffolk, Virginia Beach, and Williamsburg.

In accordance with 9 VAC 25-830-150.B.1, a linear gas pipeline and its appurtenant structures are compliant with the Chesapeake Bay Preservation Area Designation and Management Regulation by constructing, installing, operating, and maintaining the gas pipeline and appurtenant structures in accordance with (i) regulations promulgated pursuant to the Erosion and Sediment Control Law and the Virginia Stormwater Management Act, (ii) an erosion and sediment control plan and a stormwater management plan approved by the VDEQ, or (iii) local water quality protection criteria at least as stringent as the above state requirements.

Atlantic will construct, and install, and DETI will operate, and maintain the ACP Project in accordance with VDEQ-approved Annual Standards and Specifications which are consistent with the requirements of the Virginia Erosion and Sediment Control Law and associated regulations and the Virginia Stormwater Management Act and associated regulations, where applicable. As such, the ACP Project will be compliant with the Chesapeake Bay Preservation Area Designation and Management Regulation. The Erosion and Sediment Control Plan and stormwater management plans contained in the Stormwater Pollution Prevention Plan were prepared to ensure compliance with the Annual Standards and Specifications as well as other federal regulations.

Table 1-2 (below) includes a list of previous site visits completed with NAO staff as part of the permit coordination process for ACP.

TABLE 1-2

Previous NAO Site Visits and Permits related to Proposed Work in Virginia

Agency	Activity	Date
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	1/28/2015
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	1/29/2015
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	1/30/2015
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	2/5/2015
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	2/6/2015
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	2/11/2015
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	2/12/2015
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	3/11/2015
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	3/12/2015
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	3/13/2015
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	3/18/2015
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	3/19/2015
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	3/20/2015
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	4/1/2015
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	4/15/2015
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	6/10/2015
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	6/11/2015
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	4/8/2016
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	4/21/2016
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	11/14/2016
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	6/7/2017
USACE –Norfolk District	Wetland/Waterbody Boundary Verification	6/8/2017

1.0 APPLICANT, AGENT, PROPERTY OWNER, AND CONTRACTOR INFORMATION

This section is included entirely on the Standard Joint Permit Application form.

2.0 NORFOLK DISTRICT PROJECT LOCATION INFORMATION

This section includes summary information to satisfy the Project Location Information section of the JPA for the Norfolk District.

2.1 NORFOLK DISTRICT PROJECT LOCATION SUMMARY

Due to the linear nature of the project, no street address is provided. Figure A-1 is a project overview map; Figure A-2 is a District Overview map; both figures are provided in Appendix A. Table 2.1-1 provides a list of counties, U.S. Geological Survey (USGS) topographic quadrangle maps, and USGS HUC 8, sub-basins within which the ACP will occur. Figure A-3 in Appendix A contains topographic maps of the project at a scale of 1:12,000. Figure A-4 in Appendix A contains aerial photo figures of the project at a scale of 1:6,000. The latitude and longitude for ACP are as follows:

- Entering the Norfolk District: latitude 38.30503, longitude -79.81013;
- Norfolk District end of ACP in Chesapeake: latitude 36.77383, longitude 76.28172
- Norfolk District end of ACP at the VA state line: latitude 36.54521, longitude 77.50826

Approximately 307.1 miles of proposed pipeline, and associated aboveground facilities and access roads, will result in 958 single and complete crossings of Waters of the U.S. for the proposed ACP within the USACE Norfolk District. The extent of the Project in the Norfolk District includes the AP-1 mainline, consisting of approximately 234.6 miles of underground 42-inch outside diameter natural gas transmission pipeline in Highland, Bath, Augusta, Nelson, Buckingham, Cumberland, Prince Edward, Nottoway, Dinwiddie, Brunswick, and Greensville Counties, Virginia. The AP-3 lateral, approximately 71.1 miles of which will occur within the Norfolk District, will consist of 20-inch outside diameter pipeline, will originate at Compressor Station 3 in Northampton County, North Carolina, extend to the east/northeast to the Virginia State line, and continue within Greensville and Southampton Counties, and the Cities of Suffolk and Chesapeake, Virginia. The AP-4 and AP-5 lateral pipelines will also be located within the Norfolk District. The AP-4 lateral pipeline, approximately 0.4 mile of underground 16-inch outside diameter natural gas lateral pipeline, will be located in Brunswick County, Virginia. The AP-5 lateral pipeline, approximately 1.0 mile of underground 16-inch outside diameter natural gas lateral pipeline, will be located in Greensville County, Virginia.

TABLE 2.1-1

Counties, USGS Quadrangles, and HUC-8 Watersheds Crossed by the Atlantic Coast Pipeline within the Norfolk District

Project Facility	County/City	USGS Topographic Map Name(s)	USGS Hydrologic Unit Code(s)
AP-1	Highland	Paddy Knob, Mustoe, Burnsville	Upper James (02080201)
	Bath	Burnsville, Williamsville, Green Valley, Craigsville, Deerfield	Upper James (02080201) Maury (02080202)
	Augusta	Deerfield, Elliot Knob, West Augusta, Stokesville, Churchville, Greenville, Stuarts Draft, Waynesboro West, Sherando	Maury (02080202) South Fork Shanandoah (02070005)
	Nelson	Sherando, Horseshoe Mountain, Lovingston, Shipman, Howardsville	Middle James-Buffalo (02080203)
	Buckingham	Howardsville, Saint Joy, Buckingham, Andersonville, Willis Mountain	Middle James-Buffalo (02080203) Middle James-Willis (02080205)
	Cumberland	Willis Mountain, Farmville, Rice	Middle James-Willis (02080205) Appomattox (02080207)
	Prince Edward	Rice, Deatonville	Appomattox (02080207)
	Nottoway	Deatonville, Crewe West, Crewe East, Wellville, Blackstone East	Appomattox (02080207) Nottoway (03010201)
	Dinwiddie	Blackstone East, Darvills, Warfield	Nottoway (03010201)
	Brunswick	Warfield, McKenney, Smoky Ordinary, Ante	Nottoway (03010201) Meherrin (03010204)
	Greensville	Ante, Emporia, Skippers,	Meherrin (03010204) Nottoway (03010201)
AP-3	Greensville	Margarettsville	Meherrin (03010204)
	Southampton	Margarettsville, Boykins, Capron, Courtland, Franklin,	Meherrin (03010204) Nottoway (03010201) Blackwater (03010202)
	Suffolk	Franklin, Holland, Buckhorn, Windsor, Chuckatuck, Bowers Hill	Blackwater (03010202) Chowan (03010203) Hampton Roads (02080208)
	Chesapeake	Bowers Hill, Norfolk South	Albemarle (03020105) Hampton Roads (02080208)
AP-4	Brunswick	Ante	Meherrin (03010204)
AP-5	Greensville	Emporia	Meherrin (03010204)

2.2 WATERBODY AND WETLAND RESOURCES SUMMARY

The ACP pipeline, aboveground facilities, and access roads proposes a total of 958 single and complete crossings, which includes crossing of 668 wetland segments and 855 perennial, intermittent, ephemeral, and other waterbodies (e.g., ponds, ditches, reservoirs) segments in Virginia, as detailed in the tables in Appendix B. Appendix B contains tables that include details on wetlands (Tables B-1, B-2 and B-4) that include location information, HUC 8 codes, Project facility crossed, wetland type classifications, and an analysis of unavoidable impacts that are proposed (after avoidance and minimization); and details on waterbodies (Tables B-1, B-2 and B-3) which include location information, HUC 8 codes, Project facility crossed, state special designations, tributary information, and an analysis of unavoidable impacts (after avoidance and minimization) proposed. Table B-1 of Appendix B also contains a list of waterbodies crossed by

the ACP that have special standards based on VDEQ Water Quality Standards 9VAC25-260 et seq. In addition, Appendix B, Table B-5, includes a list of permanent impacts to Waters of the U.S avoided along access roads and by the use of horizontal directional drilling (HDD) within the Norfolk District.

Forty-eight waterbodies crossed by ACP in Virginia have been evaluated and determined to be subject to the subaqueous land crossing license administered by the VMRC (perennial waters with a five square mile or greater watershed). These waterbodies are listed in Table B-1, identified as perennial waterbodies with greater than five square mile watersheds (excluding waterbodies crossed by HDD, which are shown in Table B-5). Three tidal waterbodies are crossed by the ACP, including the Western Branch Nansemond River, Nansemond River, and South Branch Elizabeth River. In addition, approximately 15 tidal wetlands, primarily in the vicinity of the Western Branch Nansemond River and Nansemond River are crossed by the mainline pipeline project. Additional details are provided in Section 8.3 and in Appendix O, VMRC Tidal Wetlands Determination.

Table 1.2-1 below identifies Section 10 Navigable Waters crossed by the Project within the Norfolk District. Cross sectional views of Section 10 navigable crossings are located in Appendix C. Maps in Appendix A depict the location of project facilities on topographic maps and aerial photo maps.

Due to the linear nature of the project, overview maps in Appendix A include access roads to facilitate access to the Project. Detailed topographic and aerial photo route maps provide more detailed location information.

TABLE 1.2-1

Section 10 Navigable Waters Crossed by the Atlantic Coast Pipeline within the Norfolk District

Facility	Unique ID	Milepost	Waterbody Name	Latitude	Longitude	Construction Method
AP-1	sbup015	184.7	James River	37.66138	-78.71839	HDD*
AP-1	scuk011	220.8	Appomattox River	37.32187	-78.30574	Cofferdam
AP-3	ssol015	32.6	Nottoway River	36.63421	-76.99071	HDD
AP-3	ssoa010	38.6	Blackwater River	36.63054	-76.89126	HDD
AP-3	ssup013	63.6	Western Branch Nansemond River	36.792013	-76.577255	HDD
AP-3	nhd_va_c_048	64.4	Nansemond River	36.794797	-79.563103	HDD
AP-3	schp001	81.8	Southern Branch Elizabeth River	36.77454	-76.29541	HDD

* Horizontal Directional Drill (HDD)

The ACP will cross several Federal Emergency Management Agency (FEMA)-designated 100-year floodplains throughout Virginia. Atlantic has begun applying for applicable floodplain permits as required by regulations and local agencies. FEMA 100-year floodplains crossed by the ACP can be found in Figure A-5 in Appendix A. Atlantic has been working with the counties in Virginia and will apply for applicable floodplain permits.

3.0 DESCRIPTION OF OVERALL PROJECT, PURPOSES, NEED, USE, AND ALTERNATIVES

The project description for purposes of USACE NWP 12 verification is to construct single and complete projects crossing waters of the U.S that result in no more than minimal individual and cumulative impacts to the aquatic environment and off-setting unavoidable impacts on the aquatic environment with compensatory mitigation. The overall ACP project construction and operation to be authorized by FERC is a proposed 604.6-mile-long interstate natural gas transmission pipeline that will serve the growing energy needs of multiple public utilities and local distribution companies in Virginia and North Carolina. The natural gas transported by the ACP will be used as a fuel to generate electricity for industrial, commercial, and residential uses. The natural gas will also be used directly for residential, commercial, and industrial uses. By providing access to additional low-cost natural gas supplies, the ACP will increase the reliability and security of natural gas supplies in Virginia and North Carolina. Project facilities in Virginia are described below. Construction of the pipelines is expected to occur over approximately a two-year period beginning in November 2017. Pipeline facilities are described in Section 3.1; aboveground facilities are described in Section 3.2; access roads are discussed in Section 22.

3.1 PIPELINE FACILITIES

Atlantic proposes to construct approximately 604.6 miles of natural gas transmission pipelines in West Virginia, Virginia, and North Carolina for the entire ACP Project. This includes two new mainline pipelines (AP-1 and AP-2) and three new lateral pipelines (AP-3, AP-4, and AP-5). Detailed route overview maps depicting the locations of these facilities are provided in Appendix A. AP-1 is partially located in Virginia along with the majority of AP-3 and the entirety of AP-4 and AP-5. AP-2 is entirely located within North Carolina and will not be discussed further in this application. Table 3.1-1 provides summary information on the crossing length of each pipeline by County/City in Virginia.

The proposed AP-1 mainline, which will consist of approximately 333.1 miles of 42-inch outside diameter pipeline, will originate at a new interconnect with DETI facilities in Lewis County, West Virginia. From this point, the pipeline will extend approximately 83 miles to the southeast through West Virginia. After entering Virginia, the pipeline will continue for approximately 167 miles to the southeast, crossing through Highland, Bath, Augusta, Nelson, Buckingham, Cumberland, Prince Edward, Nottoway, Dinwiddie, Brunswick, and Greensville Counties. In Augusta County, the pipeline will pass west and south of the Cities of Staunton and Waynesboro, and in Cumberland and Prince Edward Counties, the pipeline will pass north and east of the town of Farmville. In Dinwiddie County, near the Fort Picket Military Reservation, the pipeline will turn to the south/southeast and continue for approximately 50 miles to the Commonwealth of Virginia/State of North Carolina (Commonwealth/State) line, crossing through Brunswick and Greensville Counties. The pipeline will terminate approximately 200 feet south of the Commonwealth/State line in Northampton County, North Carolina at proposed Compressor Station 3.

The AP-3 pipeline lateral, which will consist of approximately 83.2 miles of 20-inch outside diameter pipeline, will originate at Compressor Station 3 in Northampton County, North Carolina, just south of the Virginia/North Carolina state/commonwealth line. From this point,

the pipeline will extend approximately 12.2 miles through Northampton County, North Carolina to the Commonwealth/State line. After crossing into Virginia, the pipeline will extend east/northeast for approximately 71.1 miles within Virginia, crossing through Greensville and Southampton Counties, Virginia; and the Cities of Suffolk and Chesapeake, Virginia. It will terminate at a new interconnect with an existing Virginia Natural Gas pipeline on the east side of the Southern Branch Elizabeth River in the City of Chesapeake.

The AP-4 pipeline lateral, which will consist of 16-inch outside diameter pipeline, will originate approximately at milepost (MP) 279.6 of the AP-1 mainline near Lawrenceville in Brunswick County, Virginia. The lateral will extend approximately 0.4 mile due west to a new interconnect with the existing Dominion Virginia Power (DVP) Brunswick electric generating facility currently under construction.

The AP-5 pipeline lateral, which will consist of 16-inch outside diameter pipeline, will originate approximately at MP 284.4 of the AP-1 mainline in Greensville County, Virginia. The pipeline will extend approximately 1 mile to the south/southwest to an interconnection with a DVP electric generating facility currently under construction.

TABLE 3.1-1

Proposed Pipeline Facilities in Virginia for the Atlantic Coast Pipeline[a]

Pipeline Facility	County/City and (Commonwealth)	Begin Milepost	End Milepost	Length (miles)
AP-1	Highland County, VA	83.9	91.6	11.0
	Bath County, VA	91.6	106.8	22.6
	Augusta County, VA	106.8	158.2	56.2
	Nelson County, VA	158.2	184.7	27.5
	Buckingham County, VA	184.7	211.8	27.7
	Cumberland County, VA	211.8	220.8	9.1
	Prince Edward County, VA	220.8	225.9	5.2
	Nottoway County, VA	225.9	249.0	23.5
	Dinwiddie County, VA	249.0	260.7	11.7
	Brunswick County, VA	260.7	283.0	22.6
	Greensville County, VA	283.0	300.1	17.5
Subtotal				**234.6**
AP-3	Greensville County, VA	12.2	12.4	0.2
	Southampton County, VA	12.4	38.6	26.3
	City of Suffolk, VA	38.6	71.4	33.4
	City of Chesapeake, VA	71.4	82.7	11.3
Subtotal				**71.1**
AP-4	Brunswick County, VA	0.0	0.4	0.4
Subtotal				**0.4**
AP-5	Greensville County, VA	0.0	1.0	1.0
Subtotal				**1.0**
ACP Total				**307.1**

[a] The numbers in this table have been rounded for presentation purposes. As a result, the totals may not reflect the sum of the addends.

[b] The mileposts used in the FERC Application, which was filed on September 18, 2015 (FERC Accession Number 20150918-5212), were based on three-dimensional changes in topography along the proposed pipeline routes. In areas where a pipeline route has changed due to the adoption of an alternative, the mileposts in the affected area have been scaled to account for the resulting difference in the length of the route. The straight-line distance between consecutive mileposts as indicated or depicted in tables and figures in this filing may be greater than or less than 5,280 feet. The mileposts should be considered as reference points only.

As proposed, the capacity of the new pipeline system will be up to 1.5 million dekatherms per day of natural gas. The maximum allowable operating pressure of the pipelines will be 1,440 pounds per square inch gauge. The design factor and wall thickness for each pipeline will adhere to U.S. Department of Transportation requirements. The pipe will be manufactured in accordance with American Petroleum Institute Standards and all applicable Federal and Commonwealth regulations for design, permitting, construction, operation, and maintenance. Atlantic will install cathodic protection systems at various points along the proposed pipelines to inhibit external corrosion of the underground facilities in accordance with the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration requirements. The external surface of the steel pipe will also be coated with fusion-bonded epoxy that protects the external surface of the pipe against corrosion.

Atlantic collocated the proposed pipeline facilities with existing infrastructure to the maximum extent practicable. The majority of the proposed pipeline facilities will be constructed along a new (greenfield) corridor generally due to a lack of existing pipeline infrastructure in West Virginia, Virginia, and North Carolina between the proposed receipt and delivery points required for the ACP. In total, approximately 49.0 miles (17.1 percent) of the proposed pipelines within the Norfolk District are parallel to existing linear corridor facilities, including pipelines, electric transmission lines, roads, and railroads; the remainder (263.9 miles; 82.9 percent) is greenfield.

3.2 ABOVEGROUND FACILITIES

In addition to the proposed pipeline facilities, the ACP will require construction of three compressor stations, nine M&R stations, 38 valve sites, eight sets of pig launcher and receiver sites, and associated appurtenances. One of the compressor stations, four of the M&R stations, 20 valve sites, and seven of the 11 pig launchers and receivers sites occur in Virginia. The approximate locations of these facilities in Virginia are depicted in the route maps provided as Appendix A. The location of each facility by milepost and County/City is listed in Table 3.2-1. The aboveground facilities located within Virginia are described below.

Compressor Station 2 will be built at approximately MP 191.6 in Buckingham County, Virginia, where the AP-1 mainline will intersect existing Transcontinental Gas Pipe Line Company, LLC (Transco) transmission pipelines. The station will take natural gas from both the AP-1 mainline and the existing Transco pipelines. The station will be bi-directional with the ability to discharge into the AP-1 mainline downstream of the compressor station as well as the existing Transco pipelines. The station will contain four gas-driven turbines, which combined will provide approximately 40,645 horsepower of compression. The station will include approximately six structures (e.g., compressor, auxiliary, office, utility gas, drum storage, and storage building(s)), with a chain-link security fence installed around the periphery of the site. Equipment at the station will include gas filter/separators, gas coolers, inlet air filters, exhaust silencers, tanks, blowdown silencers, heaters, and auxiliary generators.

Atlantic will construct four M&R stations in Virginia at the locations identified in Table 3.2-1. The Woods Corner M&R Station will be built on the same site and within the same fenceline as Compressor Station 2. The other three M&R stations will be built at receipt or delivery points along the pipelines. Table 3.2-1 identifies the receipt and delivery volumes for each station.

TABLE 3.2-1

Proposed Aboveground Facilities in Virginia for the Atlantic Coast Pipeline

Aboveground Facility	County/City and Commonwealth	Approximate Milepost
Compressor Stations		
AP-1 Mainline		
Compressor Station 2	Buckingham County, VA	191.5
Metering and Regulating Stations		
AP-1 Mainline		
Woods Corner M&R Station	Buckingham County, VA	191.5
AP-3 Lateral		
Elizabeth River M&R Station	City of Chesapeake, VA	82.7
AP-4 Lateral		
Brunswick M&R Station	Brunswick County, VA	0.4
AP-5 Lateral		
Greensville M&R Station	Greensville County, VA	1.0
Valves [a]		
AP-1 Mainline		
Valve Site 8	Bath County, VA	93.2
Valve Site 9	Bath County, VA	105.6
Valve Site 10	Augusta County, VA	115.7
Valve Site 11	Augusta County, VA	130.8
Valve Site 12	Augusta County, VA	142.9
Valve Site 13	Nelson County, VA	149.7
Valve Site 14	Nelson County, VA	164.0
Valve Site 15	Nelson County, VA	178.4
Valve Site 16	Buckingham County, VA	191.6
Valve Site 17	Buckingham County, VA	206.3
Valve Site 18	Nottoway County, VA	225.7
Valve Site 19	Nottoway County, VA	245.2
Valve Site 20	Brunswick County, VA	264.8
Valve Site 21	Brunswick County, VA	279.6
Valve Site 22	Greensville County, VA	284.4
AP-3 Lateral		
Valve Site 34	Southampton County, VA	19.5
Valve Site 35	City of Suffolk, VA	39.0
Valve Site 36	City of Suffolk, VA	58.5
Valve Site 37	City of Chesapeake, VA	71.6
Valve Site 38	City of Chesapeake, VA	77.5
Pig Launcher/Receiver Sites		
AP-1 Mainline		
Site 2 (launcher/receiver)	Bath County, VA	105.6
Site 3 (launcher/receiver)	Buckingham County, VA	191.6
AP-3 Lateral		
Site 7 (receiver)	City of Chesapeake, VA	82.7
AP-4 Lateral		
Site 8 (launcher)	Brunswick County, VA	0.0
Site 9 (receiver)	Brunswick County, VA	0.4
AP-5 Lateral		
Site 10 (launcher)	Greensville County, VA	0.0
Site 11 (receiver)	Greensville County, VA	1.0

[a] There are no valves along the AP-4 and AP-5 pipeline laterals.

In general, each M&R station will contain two dekatherm buildings (used to house equipment such as gas chromatographs, communications equipment, etc.), a regulation building, and possibly a meter building. Equipment at each station will include gas filter/separators, gas meters, and regulators, and may include gas heaters and/or odorization equipment. Each station will be surrounded by a chain-link security fence.

Twenty valves will be installed along the proposed pipelines in Virginia at the locations identified in Table 3.2-1. The valves will be installed below grade with aboveground valve operators, risers, blowdown valves, and crossover piping connected on each side of the valve. A chain-link security fence will be installed around the periphery of each valve site. The valves will allow Atlantic to segment the pipelines for safety, operations, and maintenance purposes.

The seven pig launchers and/or receiver sites in Virginia are identified in Table 3.2-2. The pig launchers/receivers will be used to run pipeline inspection tools, called pigs, through the pipeline system. Table 3.2-2 provides details on the proposed metering and regulating stations in Virginia for the project.

TABLE 3.2-2

Metering and Regulating Stations in Virginia for the Atlantic Coast Pipeline

Station	Description	Receipt Volume (bcf/d)[a, b]	Delivery Volume (bcf/d)[a]	Bi-Directional
Woods Corner M&R Station	This station will take natural gas from the proposed AP-1 mainline and the existing Transco pipelines and have the ability to discharge into all of these pipelines.	1.00	1.40	Yes
Elizabeth River M&R Station	This station will take natural gas from the proposed AP-3 lateral and discharge into an existing Virginia Natural Gas pipeline.	Not applicable	0.35	No
Brunswick M&R Station	This station will take natural gas from the proposed AP-4 lateral and discharge to a Dominion Virginia Power electric generating facility which currently is under construction.	Not applicable	0.35	No
Greensville M&R Station	This station will take natural gas from the proposed AP-5 lateral and discharge to a proposed Dominion Virginia Power electric generating facility.	Not applicable	0.35	No

[a] bcf/d = billion cubic feet per day.

[b] The ACP has been designed to provide operational flexibility and sufficient capacity to receive fuel gas. This is why the total of the delivery volumes exceeds 1,500 mmscf/d.

Additional details of the ACP FERC facilities and general construction procedures for the overall ACP are provided in Appendix E.

3.3 CONSTRUCTION SCHEDULE

Based on Atlantic's current assumptions for the project schedule, key milestone dates for the construction schedule are summarized in Table 3.3-1.

TABLE 3.3-1

Construction Schedule by Spread for the Atlantic Coast Pipeline and Supply Header Project [a]

Spread	Approximate Mileposts	Counties/Cities and States/Commonwealths	Begin Construction	Finish Construction [d]
ATLANTIC COAST PIPELINE				
Initial Construction Activities				
Initial Site Preparation (2018 spreads)	By spread	See below	November 2017	1Q 2018
Tree Clearing (2018 spreads) [b, c]	By spread	See below	November 2017	1Q 2018
Initial Site Preparation (2019 spreads)	By spread	See below	September 2018	1Q 2019
Tree Clearing (2019 spreads) [b, c]	By spread	See below	November 2018	1Q 2019
Construction of Pipeline				
Spread 3A (AP-1) [f]	79.2-91.3	Pocahontas County, WV and Highland County, VA	April 2018	4Q 2018
Spread 4 (AP-1)	91.3-103.1	Highland, Bath, and Augusta Counties, VA	April 2019	4Q 2019
Spread 4A (AP-1) [f]	103.1-125.9	Bath and Augusta Counties, VA	April 2018	4Q 2018
Spread 5 (AP-1) [g]	125.9-183.3	Augusta and Nelson Counties, VA	February 2019	4Q 2019
Spread 6 (AP-1) [g]	183.3-239.6	Nelson, Buckingham, Cumberland, Prince Edward, and Nottoway Counties, VA	February 2018	4Q 2018
Spread 7 (AP-1)	239.6-300	Nottoway, Dinwiddie, Brunswick, and Greensville Counties, VA, and Northampton County, NC	February 2019	4Q 2019
Spread 11 (AP-3)	0.0–83.0	Northampton County, NC, Greensville and Southampton Counties, VA, and the Cities of Suffolk and Chesapeake, VA	February 2018	4Q 2018
Spread 12 (AP-4; AP-5) [e]	0.0–0.4; 0.0-1.1	Brunswick County, VA; Greensville County, VA	February 2018	4Q 2018
Construction of Compressor Stations				
Compressor Station 2	191.5	Buckingham County, VA	November 2017	4Q 2019
Construction of Metering and Regulating Stations				
Woods Corner	191.5	Buckingham County, VA	November 2017	4Q 2019
Elizabeth River	83.0	City of Chesapeake, VA	April 2018	3Q 2019
Brunswick	0.4	Brunswick County, VA	January 2018	3Q 2019
Greensville	1.1	Greensville County, VA	February 2018	3Q 2019

[a] The number and timing of the construction spreads are subject to change dependent upon construction and permit requirements.
[b] The start of tree clearing is dependent upon the results of the environmental surveys and agency consultations.
[c] Including tree clearing for aboveground facilities, access roads, and contractor yards. Tree clearing for construction spreads 1-1, 1-2, 3, 4, Blue Ridge Parkway HDD and James River HDD will take place in 2018.
[d] The finish construction date refers to the end of mechanical construction; additional restoration and post construction activity is expected to occur in the Project area beyond the timeframe reflected here. 1Q = first quarter; 2Q = second quarter; 3Q = third quarter; 4Q = fourth quarter.
[e] Spread 12 will be completed with spread 11 and is counted as one spread.
[f] Hydrostatic test and remaining cleanup will be completed by the 3rd quarter of 2019.
[g] Blue Ridge Parkway and James River HDDs will be constructed in 2018.

3.4 CONSTRUCTION EQUIPMENT

A list of typical equipment to be used during construction is presented in Table 3.4-1.

TABLE 3.4-1

Typical Construction Equipment

Activity	Typical Equipment
Clearing and Grading	Bulldozer, trackhoe, grader
Trenching	Backhoe, trackhoe
Stringing, Bending and Welding	String trucks, bending machines, side boom tractor, welding machines
Lowering-in and Backfilling	Trackhoe, side-boom tractor, padding machine, bulldozer
Clean Up and Restoration	Tractors with mulch spreaders, bulldozers, backhoes
Equipment Deployed with Each Spread	Pickups, water trucks, fuel trucks,

3.5 USACE PURPOSE AND NEED

The purpose and need for purposes of NWP 12 verification of each single and complete project is to cross wetlands, streams, and other waters while avoiding impacts to those wetlands, streams, and other waters to the maximum extent practicable and offsetting unavoidable impacts to the aquatic environment with compensatory mitigation. Additional details on the purpose and need for the ACP and SHP are provided in Section 3.6. There are no secondary purposes or further projects associated with the ACP.

3.6 FEDERAL ENERGY REGULATORY COMISSION NATIONAL ENVIRONMENTAL POLCY ACT PROJECT PURPOSE AND NEED

The following description of the purpose and need for the FERC NEPA process is provided as background information. The ACP is a proposed interstate natural gas transmission pipeline that will serve the growing energy needs of multiple public utilities and local distribution companies in Virginia and North Carolina. The natural gas transported by the ACP will be used as a fuel to generate electricity for industrial, commercial, and residential uses. The natural gas will also be used directly for residential, commercial, and industrial uses. By providing access to additional low-cost natural gas supplies, the ACP will increase the reliability and security of natural gas supplies in Virginia and North Carolina.

In recent years, demand for natural gas in Virginia and North Carolina has grown significantly. Demand for natural gas for all uses grew by 37 and 50 percent, respectively, in Virginia and North Carolina between 2008 and 2012. Demand for gas-fired electric power generation grew by 123 percent in Virginia and 459 percent in North Carolina from 2008 to 2013 (U.S. Energy Information Administration [EIA], 2015a, 2015b, 2015c, 2015d, and 2015e).

Demand for natural gas in Virginia and North Carolina is expected to increase in coming decades due to a combination of population growth and displacement of coal-fired electric power generation. The U.S. Census Bureau predicts 2.7 million new residents in Virginia and 4.2 million new residents in North Carolina between 2000 and 2030 (U.S. Census Bureau, 2014). At the same time, use of natural gas for power generation is expected to increase significantly. By 2035, natural gas is expected to surpass coal as the most common fuel for electric power generation due to coal-fired plant retirements and low natural gas prices (ICF International, 2014). The EIA (2015a) expects renewable generation to grow 1.9 percent per year, meeting a part of the demand for power, but more than 70 percent of new generating capacity will be fueled by natural gas.

A study prepared by ICF International (2014) for Atlantic projects that electric power generation in Virginia and North Carolina will increasingly rely on natural gas over the next two decades. The study predicts that between 2019 and 2038 approximately 9,900 megawatts of electric generating capacity from coal and nuclear fuels will be retired, while 20,200 megawatts of new generating capacity from natural gas will be built in Virginia and North Carolina. As a result, demand for natural gas for power generation in Virginia and North Carolina is expected to grow 6.3 percent annually between 2014 and 2035, increasing from 1 billion cubic feet per day (bcf/d) to 3.7 bcf/d.

To meet the growing demand for natural gas, the EIA (2015a) projects total United States natural gas production to increase by 56 percent from 2012 to 2040. At the same time, natural gas transmission patterns across the United States are expected to change based on the growing production from shale basins in the mid-Atlantic region. Historically, gas produced from the Gulf of Mexico, Canada, and the Rocky Mountains was delivered to markets in the eastern United States. Large increases in production from United States supply basins have created abundant, competitively priced supplies to meet the demands of the region.

A study by the U.S. Department of Energy (DOE, 2015), dated February 2015, examined the impact of increased demand for natural gas from the electric power sector on natural gas pipeline infrastructure in the United States over a 15 year period from 2015 to 2030.[1] The DOE (2015) study found that a projected 38 to 42 bcf/d of new and expanded pipeline capacity will be necessary to meet demand over the 15 year study period. The DOE study further found that flow reversal is projected to occur "to serve markets in the Southeast." Furthermore, existing pipelines that historically transported natural gas from the Gulf Coast region to points further north are expected to change the direction of flow in order to "serve the Virginia and Carolina markets" (DOE, 2015). However, there are no existing long haul interstate pipelines with available takeaway capacity from the Appalachian region directly serving Virginia and North Carolina (see Figure 1 in the DOE [2015] study).

Moreover, market participants in the region have determined that their needs cannot be adequately met by existing pipeline systems. In April 2014, Duke Energy Corporation and Piedmont Natural Gas Co., Inc. issued requests for proposals for incremental pipeline transportation service due to their existing and future natural gas generation requirements, core load growth, and system reliability and supply diversity goals. In June 2014, Virginia Power Services Energy Corp., Inc. issued a request for proposals for firm transportation service to serve Virginia. Following the request for proposals processes, these companies contracted for transportation service on the ACP, as did other companies in the region.

To meet the natural gas demand of its customers, the ACP will connect the growing demand areas in Virginia and North Carolina with growing supplies. Interstate natural gas pipelines act as common carriers to transport natural gas; they are not part of natural gas exploration or production activities. The ACP will connect growing demand areas in Virginia

[1] In comments filed with the FERC, several individuals said that demand for natural gas in Virginia and North Carolina could be met by existing pipeline systems citing this study by the DOE. The study did not conclude, as some suggested, that no additional pipeline capacity is needed to meet the increased demand for natural gas. Instead, the study found that the expected increase in pipeline capacity over the study period will be modest relative to previous expansions in pipeline capacity.

and North Carolina with growing supply areas in the Appalachian region and provide access to the Dominion South Point supply hub, consisting of abundant supplies on the DETI system that are sourced from a wide variety of upstream pipeline interconnects and diverse production areas. More specifically, the ACP will provide up to 1.5 bcf/d of firm natural gas transportation service into West Virginia, Virginia, and North Carolina.

The ACP will receive gas on behalf of its customers at two new interconnections: one between the ACP and the SHP [2] in Harrison County, West Virginia, to be known as the Marts Junction Interconnection; and one between the ACP and existing Transcontinental Gas Pipe Line Company, LLC facilities in Buckingham County, Virginia, to be known as the Buckingham Interconnect. The natural gas will be delivered to various new customer interconnects in West Virginia, Virginia, and North Carolina. Additionally, the ACP will lease capacity on a pipeline owned and operated by Piedmont Natural Gas Co. to enable certain deliveries in North Carolina.

Of the new firm transportation capacity of up to 1.5 bcf/d proposed by the ACP, 1,360,000 dekatherms per day (approximately 1.33 bcf/d) is currently subscribed pursuant to precedent agreements with six customers. These customers are major utilities and local distribution companies in the region. The precedent agreements demonstrate the need for the Projects, the demand for new gas supplies indicated in the studies noted above, and the desire for access to a new supply region. The remaining unsubscribed capacity will be awarded and contracted for in accordance with Commission policies applicable to open-access interstate pipelines and the provisions of applicable FERC gas tariffs. The natural gas supplied to each delivery point will be provided to local distribution companies, power generators, and other interstate pipeline companies.

3.7 PIPELINE RIGHTS-OF-WAY

The construction right of way for the pipeline has been minimized following FERC's "Upland Erosion Control, Revegetation, and Maintenance Plan" (Plan) and FERC's "Wetland & Waterbody Construction & Mitigation Procedures," (Procedures) as prescribed for each land type.

For the AP-1 mainline, the construction corridor in non-agricultural uplands will measure 125 feet in width, with a 40-foot-wide temporary side-casted soil storage side and an 85-foot-wide working side. In areas where full width topsoil segregation is required (e.g., agricultural areas), an additional 25 feet of temporary construction workspace will be needed on the working side of the corridor to provide sufficient space to store topsoil. In wetlands, the width of the construction right-of-way will be reduced to 75 feet, with 25 feet on the soil storage side and 50 feet on the working side. Following construction, a 50-foot-wide permanent easement will be maintained for operation of the AP-1 pipeline.

In northwestern Virginia the proposed AP-1 mainline will be constructed in steep, mountainous terrain. Generally, the pipeline alignment will run along ridgelines and up and

[2] The ACP and SHP are separate projects with separate applicants, but are being reviewed as connected actions by FERC through development of a single Environmental Impact Statement.

down slopes (as opposed to crossing laterally alongside-slopes). Installation along the ridgelines may require the pipe to be buried deeper than normal (i.e., with greater than 3 feet of cover over the pipeline, which is typical in non-agricultural uplands). This is due in part to the techniques needed to construct along narrow ridgelines. The surface of ridgelines may be temporarily lowered to create a level construction right-of-way (125 feet wide). Excavation of the trench will begin from the leveled work area. When the temporary right-of-way is restored to pre-construction contours, the depth of cover over the pipeline could exceed the minimum of 3 feet by an additional 7 feet or more.

For pipeline construction, the top width of the excavated pipe trench will typically range from 8 to 15 feet. This assumes that construction personnel will not be required to work in the trench. In areas of steep terrain (defined for this NWP as slope of 5 percent or greater) where construction personnel will likely be required to work in the trench, the top of the trench will typically be 30 feet wide. If it is necessary to expose the installed pipeline for maintenance activities during operations, a wider trench would need to be excavated. Unlike the initial installation of the pipeline, the lowering of the surface of the ridgeline to create a level construction right-of-way would not be an option during operations due to the lack of temporary workspace outside the permanent easement. Therefore, the trench would have to daylight to the natural grade of the ridgeline resulting in a wider trench at the top.

In determining the width of the permanent right-of-way needed along narrow ridgelines and steep terrain for operation of the AP-1 mainline, the following assumptions were made:

- 42-inch-diameter pipe;
- 10 feet depth of cover over the pipeline, and possibly greater depth of cover at over-bends and along ridgelines; and
- 1V:1H grade (45 degrees) on the trench walls.

Based on these assumptions, if it is necessary to expose the installed pipeline for maintenance activities, the width at the top of the trench could be approximately 40 feet along ridgelines in areas with steep terrain.

For the AP-1, AP-3, AP-4, and AP-5 pipelines, the construction corridor in non-agricultural uplands and in wetlands will measure 75 feet in width, with a 25-foot-wide soil storage side and 50-foot-wide working side. In areas where full width topsoil segregation is required (e.g., agricultural areas), an additional 25 feet of temporary construction workspace will be needed on the working side of the corridor to provide sufficient space to store topsoil. Following construction, a 50-foot-wide permanent easement will be maintained for operation of the AP-3, AP-4, and AP-5 pipeline laterals.

Therefore, following construction within the 50-foot-wide permanent easements, the following maintenance will occur:

1) Ten feet centered over pipeline – maintained in an herbaceous state to facilitate periodic aerial inspections. These areas will be reseeded with native wetland seed mix to stabilize the area within wetland.

2) Thirty feet centered over pipeline – trees with roots that could compromise the integrity of the pipeline coating would be selectively removed. These areas will be reseeded with native wetland seed mix to stabilize within wetlands following construction.

3) Outside the 30-foot-wide maintenance corridor on either side of pipeline – Allowed to regrow with no restrictions - no vegetation maintained by Atlantic. Atlantic will reseed these temporarily-disturbed wetland areas with native wetland seed mix to stabilize within wetlands following construction.

Following construction of the ACP, land within the temporary construction right-of-way will be restored to preconstruction conditions and uses. Additionally, although approximately 2,573 acres of lands will be maintained as permanent easement for operation of the ACP, impacts in areas such as cultivated fields and pastures will be short term. These areas will be restored within 12 months to preconstruction conditions and uses following installation of the pipeline.

In addition to the construction rights-of-way, additional temporary workspace (ATWS) will be required to stage construction activities and store equipment, materials, and excavated soil at wetland, waterbody, and road crossings. ATWS will also be required in areas with steep side slopes or where special construction techniques are implemented as well as at tie-ins with existing pipeline facilities, utility crossings, truck turnaround areas, and spread mobilization/de-mobilization areas.

For the AP-1 mainline, ATWS measuring 50 by 150 feet will typically be required on both sides of the construction corridor and both sides of the crossing at wetlands, waterbodies measuring greater than 10 feet in width, two lane roads, and railroads. ATWS measuring 25 by 100 feet will typically be required on both sides of the construction corridor and both sides of the crossing at waterbodies measuring less than 10 feet in width and single lane roads. For the AP-3, AP-4, and AP-5 laterals ATWS measuring 25 by 100 feet will typically be required on both sides of the construction corridor and both sides of the crossing at wetlands, waterbodies, roads, and railroads. Following construction of the pipelines, ATWS will be restored to pre-existing conditions and uses.

Construction of the proposed ACP and SHP will follow industry-standard practices and procedures as described below. Typically, construction of the pipeline will follow a set of sequential operations, unique to the pipeline industry, which is described below. During construction, the FERC requires implementation of the Plan and Procedures. The Plan and Procedures identify a variety of measures designed to minimize erosion, enhance revegetation, and minimize impacts on waterbodies and associated aquatic resources, such as the installation and maintenance of sediment and erosion controls at waterbody crossings, respectively. Atlantic will adopt and implement the 2013 versions of the Plan and Procedures with proposed Project-

specific modifications in accordance with Commonwealth erosion and sediment control requirements.

3.8 SPECIAL CONSTRUCTION TECHNIQUES

In addition to standard pipeline construction methods, Atlantic will use special construction techniques where warranted by site-specific conditions, (e.g., when constructing across waterbodies, wetlands, roads, highways, railroads, steep terrain, karst areas, agricultural areas, and residential areas; when blasting through rock; or when working in winter conditions). Each of these specialized measures is described below. Illustrations of select crossing methods are provided in the construction typical drawings provided in Appendix F.

3.8.1 Waterbody Crossing Methods

Construction involving wetlands and waterbodies may require special construction techniques. The waterbody crossing methods are prescribed in accordance with the Procedures based on size (using width at water's edge at the waterbody at the time of crossing); minor waterbodies includes all waterbodies less than or equal to 10 feet wide; intermediate waterbodies includes all waterbodies greater than 10 feet, but less than or equal to 100 feet wide; and major waterbodies includes all waterbodies greater than 100 feet wide. Special construction techniques that are likely to be used during construction to cross waterbodies are briefly described below.

Open-Cut Method

The open-cut or wet trench crossing method will involve trenching through the waterbody while water continues to flow through the trenching area. Prior to initiating construction across the waterbody, the crossing section of pipeline will be fabricated (i.e., bent, welded, and coated) in adjacent ATWS areas. Backhoe-type excavators will then be used to excavate a trench in the flowing waterbody from one or both banks of the waterbody. Where the waterbody is too wide to excavate the trench from the banks, equipment may operate from within the waterbody with approval from the appropriate regulatory agencies. Equipment operating within the waterbody will be limited to that needed to construct the crossing. During these operations, flow will be maintained at the crossing as specified in the Procedures. Turbidity curtains, or silt fence depending on the depth of water, will be installed downstream of the crossing as necessary to minimize suspended solids in the water. Construction will be completed in accordance with the Procedures, which require construction across waterbodies with perceptible flow at the time of crossing in the following timelines: minor waterbodies (up to 10 feet in width) within 24 hours; intermediate waterbodies (greater than 10 feet and less than or equal to 100 feet wide) within 48 hours; and for major waterbodies over 100 feet Atlantic will construct as quickly as practicable, but does not anticipate temporary work associated with pipeline construction within Waters of the U.S. for longer than the maximum timeframe of one year.

Temporary side-cast material excavated from the trench will be placed on the bank above the high water mark (at least 10 feet from the edge of the water) or placed adjacent to the trench in the stream (major waterbodies only, in accordance with the Procedures) for use as backfill. A prefabricated segment of pipeline will then be placed into the trench using side-boom tractors.

Concrete coating (installed in uplands in project workspace) or bag weights will be utilized, as necessary, to provide negative buoyancy for the pipeline. Once the trench is backfilled, the banks will be restored to pre-construction contours and stabilized as described above. For each of the methods below, waters that have been temporarily disturbed by construction activities will be restored to their pre-construction contours within 12 months of commencing the temporary impact's construction, unless an approved extension of this time is authorized according to discretional authority by the NAO District Engineer.

Throughout the construction process, Atlantic will follow the Procedures to avoid or minimize impacts on water quality. Construction activities will be scheduled so that the trench is not excavated across the waterbody until immediately prior to pipe laying activities.

Dry Crossing

Atlantic will implement dry crossing methods of waterbodies where techniques will support the passage of stream flow. There are two primary crossing methods that include installation of pipeline in dry streambed conditions: the flume method and dam-and-pump method. In each case, normal stream flows are maintained upstream and downstream of the work area.

Flume Method

The flume crossing method consists of isolating and temporarily diverting the flow of water across the trenching area through one or more large-diameter, steel flume pipes placed in the waterbody. This method allows for trenching to occur within a relatively dry stream or riverbed (i.e., beneath the flume pipes containing the water flow) thereby minimizing sedimentation and turbidity in the waterbody. The flume method is typically used to cross small to intermediate flowing waterbodies that support coldwater or other significant fisheries.

For each waterbody where the flume method is implemented, a sufficient number of adequately sized flume pipes will be installed in the waterbody to accommodate the highest anticipated flows during construction. Atlantic will use stream gauge data from the USGS to determine the highest anticipated flows during the time the flume crossing is in effect. In the absence of stream gauge data, Atlantic engineers and Environmental Inspectors will estimate the highest anticipated flows based on the width of the waterbody at the ordinary high water mark, the depth of the waterbody, existing flows at the time of the crossing, and the weather forecast at the time of the crossing. As a contingency, Atlantic will stage additional flume pipes at the crossing in the event that the volume of flow increases due to a precipitation event.

Prior to installation, Atlantic will visually inspect the flume pipes to confirm that they are free of dirt, grease, oil or other pollutants. After placing the pipes in the waterbody, sand- or pea gravel-filled bags, water bladders, or metal wing deflectors will be placed in the waterbody around the flume pipes upstream and downstream of the proposed trench. These devices will serve to dam the stream and divert the water flow through the flume pipes thereby isolating the water flow from the construction work area between the dams.

After installation of the flume pipes, the remaining standing water between the dams will be pumped out. Pump intakes will be appropriately screened to prevent entrainment of aquatic species. Fish trapped in the dewatered area will be removed and returned to the flowing waterbody. Leakage from the dams or subsurface flow from below the waterbody bed may cause water to accumulate in the trench once trenching has begun. If water accumulates in this area, it may be periodically pumped out and discharged into energy dissipation/sediment filtration devices as required by the Procedures. Such devices include geotextile filter bags or straw bale structures. Alternatively, the water will be discharged into well-vegetated areas away from the edge of the waterbody, to prevent silt-laden water from entering the waterbody.

Backhoe-type excavators located on the banks of the waterbody will be used to excavate a trench under the flume pipe across the dewatered streambed. Temporary side-cast material excavated from the waterbody trench will be stored on the bank above the high water mark and a minimum of 10 feet from the edge of the waterbody. Once the trench is excavated, a prefabricated segment of pipe will be installed beneath the flume pipes. The trench will then be backfilled with the native material excavated from the trench across the waterbody bed. The banks will be stabilized before removing the dams and flume pipes and returning flow to the waterbody channel.

The flume method has proven to be an effective technique for constructing pipelines across sensitive waterbodies. The potential for the introduction of turbidity or suspended sediments is limited, because sediment generated during trench excavation and backfilling operations is isolated to the dewatered area between dams. When flumes are installed properly, the operation of the flume is generally stable and can be left in place for periods prior to and following the installation of the waterbody pipeline crossing. The flume method also provides for continued fish passage through the construction work area via the flume pipes during construction.

Dam-and-Pump Method

The dam-and-pump method generally is preferred for smaller waterbodies, where mechanical pumps can dependably convey stream flows. In this approach, pumps and hoses are used instead of flume pipes to isolate and transport the stream flow around the construction work area. Similar to the flume method, the objective of the dam-and-pump method is to create a relatively dry work area to avoid or minimize the transportation of sediment and turbidity downstream of the crossing during in-stream work.

As the first step in implementing the dam-and-pump method, one or more pumps and hoses of sufficient size to transport anticipated flows will be installed adjacent to the waterbody. Additional back-up pumps will be on site at all times as a contingency, in case of pump failure. Once the pumps are operational, the waterbody upstream and downstream of the construction area will be dammed with sandbags and/or steel plates. As the dams are installed, the pumps will be started to maintain continuous flow in the waterbody.

Following the installation of the dams, the pumps will be run continuously until the pipeline is installed across the waterbody and the streambed and banks are restored. Pump intakes above the upstream dam will be appropriately screened to prevent entrainment or

impingement of aquatic species. Energy-dissipation devices, such as splash blocks, filter bags, or energy dissipation sleeves, will be used to prevent scouring of the streambed at the discharge location. Water flow will be maintained through all but a short reach of the waterbody at the actual crossing location.

Backhoe-type excavators located on the banks of the waterbody will be used to excavate a trench across the waterbody. Temporary side-cast materials removed from the trench will be placed and stored on the bank above the high water mark at a minimum of 10 feet from the edge of the water. Trench plugs will be maintained between the upland trench and the waterbody crossing. Once the trench is excavated, a prefabricated segment of pipe will be installed. The trench will then be backfilled with the native material excavated from the trench across the waterbody bed. After backfilling, the dams will be removed and the banks restored and stabilized as described above.

Conventional Bore

In some cases, waterbodies may be crossed by conventional subsurface boring beneath the waterbody. Boring involves installing pipeline through a hole bored through the substrate. Where this method is implemented, equipment operating from pits excavated on either side of the crossing will bore through the substrate beneath the waterbody. If dewatering of the pits is necessary, it will be conducted in accordance with the Plan and Procedures and applicable permits in a manner that will minimize erosion and prevent silt-laden water flowing into the waterbody or adjacent wetlands.

During a conventional bore crossing, the pipeline will be pushed through the bore under the waterbody. The conventional bore can eliminate direct surface impacts on waterbodies, however, there are limitations to its use. This method cannot typically be used to cross waterbodies with unconsolidated soils in the substrate because it is not possible to maintain the integrity of the borehole in this condition.

Because conventional bores in general are installed straight along a horizontal plane, the bore pits must be excavated to a depth sufficient to allow installation of pipe at the appropriate depth beneath the streambed (i.e., 5 feet beneath the streambed) and to account for the height of the boring machinery. Where waterbodies are entrenched or adjacent slopes are steep, excavation to sufficient depths can require excessively large pits to address Occupational Safety and Health Administration shoring requirements, which creates the potential to sink the stream or flood the bore pits. These considerations limit the use of this crossing method for entrenched waterbodies or those with steep slopes.

Cofferdam

Some waterbodies will be crossed using the cofferdam method. In this method, a temporary diversion structure is installed from the bank around half the width of the crossing to isolate that section of the stream from the rest of the waterbody. Once the temporary diversion structure is installed, water is pumped from the isolated section to allow excavation of the pipe trench from the bed of the waterbody in the dry. After the pipe is installed in the trench in the isolated section of stream, the temporary diversion structure is disassembled and reinstalled from the opposite bank of the crossing and the process is repeated. The cofferdam method allows

waterbodies to be crossed in the dry in discrete sections while water flows unimpeded around the temporary diversion structure. The method is sometimes favored for wide, relatively shallow waterbodies or waterbodies containing sensitive fisheries because it allows water and fish to pass around the temporary diversion structure.

For waterbodies crossed using the cofferdam method, sections of steel frame for the temporary diversion structure will be assembled in an upland area adjacent to the crossing. Depending on size, the frame sections will be placed in the waterbody either manually or by crane. The frame sections will be positioned around a predetermined perimeter in the waterbody extending from one of the banks. The spacing of frame sections will be based on the depth of the water, but a typical spacing will be 15 to 30 inches. The frame sections may be reinforced, as necessary, with steel poles or other supports to increase stability of the structure, especially in waterbodies with soft substrate. Fabric sheets will then be attached to the top of the frame and unrolled down and out onto the bed of the waterbody on the exterior side of the frame. The fabric sheets will create a liner around the frame with a seal on the bed of the waterbody. The fabric may be covered in soft sediments or sandbags to help create the seal.

After the temporary diversion structure is installed, one or more pumps will be used to dewater the area within the temporary diversion structure. The pump intakes will be appropriately screened to prevent entrainment of aquatic species. Water will be discharged to the waterbody outside the structure through an energy-dissipating device to prevent scouring of the bed at locations of discharge.

Once dewatering is complete, any fish trapped in the temporary diversion structure will be removed and returned to the flowing waterbody. Construction equipment will enter the isolated section of the waterbody from the adjacent bank. This construction equipment will be used to excavate the trench, install a pre-assembled section of pipe, backfill the trench, and restore the bed as near as practicable to pre-construction contours. The equipment is removed from the temporary diversion structure via the adjacent bank.

After the section of pipeline is installed, the enclosed area within the temporary diversion structure will be flooded. Then the fabric sheets and steel frame sections will be disassembled. The structure will be reinstalled from the opposite bank, with enough overlap of the initial excavation area so that the installed section is accessible for tie-in to the next section of pipe. The dewatering and construction process is then repeated from the opposite bank, to complete the crossing of the waterbody.

Horizontal Directional Drill Method

The HDD method allows for trenchless construction by drilling a hole beneath a surface feature, such as a waterbody or other unique resource, and installing a prefabricated segment of pipeline through the drill bore. The method avoids disturbance to the surface of the right of way between the entry and exit points of the drill. The method is sometimes used to install pipelines underneath sensitive resources or areas that present difficulties for construction or access using typical installation methods. The HDD method can provide certain advantages over typical construction methods, such as avoidance of surface disturbance, riparian tree clearing, or in-

stream construction. Right-of-way maintenance will not occur between the HDD entry and exit points.

The HDD method requires that a prefabricated segment of pipe at least the length of the bore hole be staged in line with the drill path at the exit hole, opposite the placement of the drilling rig. This "pullback" generally requires a false right-of-way that can deviate from the right-of-way approaching the crossing, unless the drill alignment is directly in-line with the construction right-of-way for the length of the prefabricated pipe segment. In many cases the drill path is not in-line with the construction right-of-way and additional workspace that extends well outside of the standard construction right-of-way must be cleared and graded to accommodate the prefabrication of the pipe segment described above. In addition, work space required at the entry and exit holes, although temporary, is approximately 300-feet by 300-feet.

The path of the drill is constrained by the flexibility of the pipe; the depth beneath the wetland and/or waterbody needed to achieve a successful installation; and the elevation of the entry and exit points. The entry and exit points should be similar in elevation to prevent a significant pressure differential that can contribute to failure of the HDD operation. Maintaining a consistent pressure helps in maintaining a predictable flow of drilling mud and thus leads to a greater likelihood of a successful HDD.

As a rule of thumb used in evaluating the feasibility of the HDD method, the 42-inch diameter pipe requires a minimum drill path of 2,200 feet and the 36-inch pipe requires a minimum drill path of 1,800 feet to achieve an acceptable radius of curvature that will prevent a catastrophic "crinkling" of the pipe as it conforms to the path of the drill hole. All proposed HDD crossings will be designed based on specific site constraints at the crossing and geologic conditions, therefore site-specific designs may vary from the planning guidelines.

HDD poses a higher risk to construction scheduling. Typical installations of this pipe size take several months which increases the potential impact to the surrounding communities and environment. In the event the initial bore is unsuccessful the process would start again in the immediate vicinity further increasing the impact.

A large drill can be more expensive than traditional crossing methods and can take several months to install. Using traditional crossing methods, crossings of typical minor or intermediate waterbodies can be completed within a day or a few days, and crossings of major waterbodies can typically be completed in less than 30 days. Due to the extended time of exposure of additional workspace associated with HDD coupled with the potential for an inadvertent return, traditional crossing methods can often reduce the environmental impact when compared with HDD. Based on these constraints and design considerations the HDD method is feasible and practicable where large, deep waterbodies are encountered and sufficient space to place the pullback and work area for drilling equipment is available.

For each HDD crossing, electric grid guide wires will be laid by hand on the ground along the pipeline centerline to create an electromagnetic sensor grid. The grid will be used by the HDD operator to steer the drill head during drilling. The sensor grid will be fabricated by installing several stakes along the drill path and wrapping them with an insulated coil wire. The wire will be energized with a portable generator, which will create a magnetic field that can be

used to track the drill bit. No ground or surface disturbing activities will be required for installation of the guide wires; however, in thickly vegetated areas a two- to three-foot wide path may need to be cut with hand tools for the wires. Other methods such as gyroscope guidance systems may be utilized in specific situations as an alternative to electric grid guidance.

Prior to the final design and selection of the HDD method, geotechnical investigations occur at each proposed crossing to ensure that the underlying geology supports the installation. Minor disturbance may be necessary to conduct this investigation. To complete each HDD, a drill rig will be placed on the entry side of the crossing and a small-diameter pilot hole will be drilled along a predetermined path beneath the waterbody using a powered drill bit. As drilling progresses, additional segments of drill pipe will be inserted into the pilot hole to extend the length of the drill. The drill bit will be steered and monitored throughout the process to maintain the designated path of the pilot hole. Once the pilot hole is complete the hole will be enlarged to accept the pipeline. The HDD may require a drill rig on both sides due to the complexity of the drill, for reasons including but not limited to, length, substrate, noise, or duration.

To enlarge the pilot hole, a larger reaming tool will be attached to the end of the drill on the exit side of the hole. The reamer will be drawn back through the pilot hole to the drill rig on the entry side of the hole. Drill pipe sections will be added to the rear of the reamer as it progresses toward the rig, allowing a string of drill pipe to remain in the drill bore at all times. Several passes with progressively larger reaming tools will be required to enlarge the hole to a sufficient diameter to accommodate the pipeline. The final hole will be approximately 12 inches larger than the pipeline to be installed.

Throughout the drilling process, a fluid mixture consisting of water and bentonite clay (a naturally occurring mineral) will be pumped into the drill hole to lubricate the bit, transport cuttings to the surface, and maintain the integrity of the drill bore. Water for the mixture will be pumped from the waterbody to the drill site through a hose or temporary network of irrigation-type piping or trucked in from another source. The pump intake will be appropriately screened to prevent entrainment of aquatic species. Small pits may be dug at or near the entry and exit points for the HDD to temporarily store the drilling fluid and cuttings. The fluid and cuttings will be pumped from the pits to an on-site recycling unit where the fluid will be processed for reuse.

The pipeline segment (also called a pull section) to be installed beneath the surface feature will be fabricated on the right-of-way or in the ATWS on the exit side of the crossing while the drill hole is reamed to size. Once assembled, the girth welds of the pull section will be coated with fusion-bonded epoxy. A sacrificial abrasion resistant overlay would be applied over the fusion-bonded epoxy coating at the pipe mill for protection from abrasive materials that may be encountered as the pull section is installed. These coating materials on girth welds will be mixed in an upland area prepared to contain spills; splash pads, plastic or other material will be placed on the ground in the mixing area to contain any potential spills. Activities will occur in accordance with the Spill Prevention, Control, and Countermeasures (SPCC) Plan (see Appendix H). The pull section will be inspected and hydrostatically tested prior to installation. A steel bullhead will be welded onto the front end of the pull section to aid in pulling the pipe through the drill hole. After the hole is completed, the pipeline segment will be attached to the drill string on the exit side of the drill bore and pulled back toward the drill rig.

As the pipeline is being installed, excess drilling fluid will be collected and disposed of at an approved facility or, as allowed and approved by the agencies and landowner. The HDD drilling fluid is a mixture of bentonite clay (a naturally occurring material) and water. Excess drilling fluid will not be incorporated into soils under any circumstances within or adjacent to habitats with known federally listed plant species. If water is left over from the drilling process, it will be discharged in accordance with the Plan and Procedures and applicable permits into a well-vegetated upland area or an energy dissipation/sediment filtration device, such as a geotextile filter bag or straw bale dewatering structure, at the site.

Successful crossings utilizing HDD will result in little to no impact on the surface feature being crossed. If a natural fracture or weak area in the ground is encountered during drilling, an inadvertent return of drilling fluid to the environment could occur. Substrate consisting of unconsolidated gravel, coarse sand, or fractured bedrock could increase the likelihood of an inadvertent return. Depending on the orientation of the natural fracture or substrate, the drilling fluid may move laterally or vertically from the drill hole. If the drilling fluid moves laterally, the release may not be evident on the ground. For an inadvertent return to be evident on the surface there must be a preferential pathway extending vertically from the drill hole to the surface of the ground. The volume of fluid released in an inadvertent return would depend on a number of factors, including the size of the pathway, the permeability of the geologic material, the viscosity of the fluid, and the pressure of the hydraulic drilling system. The drilling fluid is a closed system that is monitored closely for changes in pressure and volume, which may indicate development of an inadvertent return. If a change in pressure is identified, corrective action will occur.

Atlantic has prepared an HDD Fluid Monitoring, Operations, and Contingency Plan (HDD Plan) which describes the measures to be implemented in the event of an inadvertent return; see Appendix G for a copy of the HDD Plan. If a release occurs on land, including within a wetland, a small pit will be excavated at the release site to contain the spread of the fluid, and a pump will be used to transfer the fluid from the pit into a containment vessel. If an inadvertent return occurs in a waterbody it will be more difficult to contain because the fluid may be dispersed into the water and carried downstream. In this situation, thickening agents such as additional bentonite, cottonseed hulls, or other non-hazardous materials will be added to the drilling fluid, in order to plug the flow path. All drilling fluid additives will be non-hazardous. Once a drilling contractor has been selected and the specific additives are identified, a list of the additives will be compiled in site-specific HDD Plans along with appropriate Safety Data Sheets and product descriptions. Atlantic will consult with and obtain permission from the appropriate State/Commonwealth regulatory agencies regarding the use of additives during the HDD process and confirm that additives will not violate water quality standards.

The HDD method will not be used in areas with the potential to contain karst features due to the potential for drilling fluid to enter aquifers through pre-existing voids or conduits in limestone or dolomite bedrock. This will avoid the potential for drilling fluid to reach groundwater and wells in karst areas. In other areas, Atlantic will monitor source waters along and near the drill path, such as seeps and springs, for inadvertent returns. Atlantic will implement the measures identified in the HDD Plan to control and clean up the inadvertent return, test the water for water quality, and provide an alternate supply of water to affected landowners until the inadvertent return is remediated.

The proposed HDD crossing locations on ACP constitute those where it is feasible and potential for a successful drill is acceptable.

For the ACP, the HDD method is proposed for the following river crossings in Virginia pending the results of geotechnical investigations and final engineering:

- the James River crossing approximately at MP 184.7 of the AP-1 mainline at the Nelson/Buckingham County line in Virginia;
- the Nottoway River crossing approximately at MP 32.6 of the AP-3 lateral in Southampton County, Virginia;
- the Blackwater River crossing approximately at MP 38.6 of the AP-3 lateral at the Southampton County/City of Suffolk line in Virginia;
- the Western Branch Nansemond River crossing approximately at MP 63.6 of the AP-3 lateral in the City of Suffolk, Virginia;
- the Nansemond River crossing approximately at MP 64.4 of the AP-3 lateral in the City of Suffolk, Virginia; and
- the Southern Branch Elizabeth River crossing (part of the Intracoastal Waterway) approximately at MP 81.8 of the AP-3 lateral in the City of Chesapeake, Virginia.

Proposed crossings of three USACE Civil Works Projects include the Southern Branch Elizabeth River, Western Branch Nansemond River, and Nansemond River will be constructed utilizing the HDD method. Site specific drawings provide in Appendix C provide the depth of the proposed HDD below the navigation channel for each of these crossings. Please see the Section 408 USACE Projects section near the end of the document for further discussion regarding Section 408 Permission to cross these waterways.

3.8.2 Additional Mitigation Measures at Waterbody Crossings

Atlantic will use the open-cut, flume, dam-and-pump, conventional bore, cofferdam, or HDD methods to construct the pipelines across waterbodies. In each case and for each method, Atlantic will adhere to the measures specified in FERC's Plan and Procedures [3] unless site-specific modifications to the Procedures are requested by Atlantic and approved by FERC; as well as any additional requirements identified in federal or Commonwealth waterbody crossing permits, including applicable permits and approvals from the USACE and various Commonwealth agencies (see Section 4.0). A complete list of the waterbodies along the proposed pipeline routes within the Norfolk District, and the construction method proposed for each single and complete project, is provided in Table B-1 of Appendix B. Construction methods for waterbodies that isolate the pipeline trench from flowing water (e.g. flume, dam-

[3] Copies of FERC's Plan and Procedures are available on FERC's website at http://www.ferc.gov/industries/gas/enviro/guidelines.asp.

and-pump, cofferdam) will be utilized where these methods are proposed and perceptible flow is present at the time of the crossing.

During the clearing and grading phase of construction, temporary bridges will be installed across waterbodies in accordance with the Procedures to allow construction equipment and personnel to cross. The bridges may include clean rock fill over culverts, timber mats supported by flumes, railcar flatbeds, flexi-float apparatuses, or other types of spans. Construction equipment will be required to use the bridges, except that the clearing and bridge installation crews will be allowed one pass through waterbodies before bridges are installed. The temporary bridges will be removed when construction and restoration activities are complete.

ATWS will be required on both sides of waterbody crossings to stage construction equipment, fabricate the pipeline, and store construction materials. The ATWS will be located at least 50 feet away from the water's edge at each waterbody (with the exception of site-specific modifications as requested by Atlantic and approved by the FERC).

Clearing adjacent to waterbodies will involve the removal of trees and brush from the construction right-of-way and ATWS areas. Clearing and grubbing adjacent to waterbodies will be limited to the permanent easement. Woody vegetation within the construction right-of-way will be cut to ground level with stumps in place, while stumps over the trench will be removed. Stumps along the waterbody banks will only be removed over the trench or where necessary for installation of bridges/timber mats for safety reasons. Sediment barriers may be installed at the top of the bank if no herbaceous strip exists. Initial grading of the herbaceous strip will be limited to the extent needed to create a safe approach to the waterbody and to install temporary bridges.

During clearing, sediment barriers will be installed and maintained across the right-of-way adjacent to waterbodies and within ATWS to minimize the potential for sediment runoff. Erosion control devices located across the working side of the right-of-way will be removed during the day when vehicle traffic is present, and will be replaced each night. Alternatively, drivable berms may be installed and maintained across the right-of-way in lieu of silt fences and/or straw bales.

Typically, equipment refueling and lubricating at waterbodies will take place in upland areas that are 100 feet or more from the edge of the waterbody and any adjacent wetlands. However, there will be certain instances where equipment refueling and lubricating may be necessary in or near waterbodies. For example, stationary equipment, such as water pumps for dam and pump crossing method or withdrawing hydrostatic test water, may need to be operated continuously on the banks of waterbodies and may require refueling in place. Atlantic's SPCC Plan will address, among other items, the handling of fuel and other materials associated with the ACP. As required by the Procedures, the SPCC Plan will be available during construction on each construction spread. The SPCC Plan is provided in Appendix H.

After the pipeline is installed across a waterbody using one of the methods described above, the trench will be backfilled with native material excavated from the trench. This native material will be used to bring the stream bottom elevation outside of the pipe openings both upstream and downstream back to pre-construction elevations, rather than filling the excavated

stream bottom with riprap in order to support the re-establishment of a surface water channel to allow for the movement of aquatic organisms.

The top 12 inches of substrate will be segregated and returned to the surface at original grade after pipeline installation. If present and moved prior to construction, larger rocks or boulders will be replaced in the stream channel within the construction area following backfill of the trench. The streambed profile will be restored to preconstruction contours and grade conditions to prevent scouring. The stream banks will then be restored as near as practicable to preconstruction conditions and stabilized. Stabilization measures would include seeding, installation of erosion control blankets, or installation of riprap materials, as appropriate. Jute thatching or bonded fiber blankets will be installed on banks of waterbodies or road crossings to stabilize seeded areas. Temporary erosion controls will be installed immediately following bank restoration. The waterbody crossing area will be inspected and maintained until restoration of vegetation is complete. Additional details on site restoration can be found in the Restoration and Rehabilitation Plan, Appendix I.

For HDD crossings, Atlantic has prepared an HDD Plan that will address the prevention, containment, and cleanup of sediment or other materials caused by inadvertent returns of drilling fluids to Waters of the U.S., through sub-soil fissures, or fractures. If an inadvertent return of drilling fluids to Waters of the U.S. occurs, and the remediation requires work within Waters of the U.S., Atlantic will notify appropriate agencies immediately as specified in the HDD Plan.

3.8.3 Wetland Crossing Methods

Construction across wetlands will be conducted in accordance with the Procedures, site-specific modifications to the Procedures requested by Atlantic and approved by the FERC, and any additional requirements identified in federal or Commonwealth wetland crossing permits. Typical methods for construction across wetlands are described below. A list of wetland single and complete projects along the proposed pipeline route within the Norfolk District is provided in Tables B-1 and B-2 of Appendix B.

In accordance with the Procedures, the width of the construction right-of-way will be limited to 75 feet through wetlands, with ATWS on both sides of wetland crossings to stage construction equipment and materials, fabricate the pipeline, and store materials and excavated temporary side-cast material. ATWS will be located in upland areas a minimum of 50 feet from the wetland edge (with the exception of site-specific modifications as requested by Atlantic and approved by the FERC).

Wetland boundaries will be clearly marked in the field prior to the start of construction with signs and flagging. Construction equipment working in wetlands will be limited to what is essential for right-of-way clearing, excavating the trench, fabricating and installing the pipeline, backfilling the trench, and restoring the right-of-way. In areas where there is no reasonable access to the right-of-way except through wetlands, non-essential equipment will be allowed to travel through wetlands once, unless the ground is firm enough or has been stabilized to avoid rutting. Stabilization may include use of rip-rap or prefabricated timber mats. Temporary stabilization materials placed in the wetlands will be removed during the restoration of the right-of-way.

Clearing of vegetation in wetlands will be limited to trees and shrubs, which will be cut flush with the surface of the ground and removed from the wetland. To avoid excessive disruption of wetland soils and the native seed and rootstock within the topsoil, stump removal, grading, topsoil segregation, and excavation will be limited to the area immediately over the trenchline, except a limited amount of stump removal and grading may be conducted in other areas if required by safety-related issues. Topsoil segregation over the trenchline will only occur if the wetland soils are not saturated at the time of construction.

As part of the process of the land clearing, sediment barriers, such as silt fences, straw bales, or other approved sediment barriers, will be installed and maintained adjacent to wetlands and within ATWS areas as necessary to minimize the potential for sediment runoff. Sediment barriers will be installed across the full width of the construction right-of-way at the base of slopes adjacent to wetland boundaries. Erosion control devices installed across the working side of the right-of-way will be removed during the day when vehicle traffic is present, and will be replaced each night. Alternatively, drivable berms may be installed and maintained across the right-of-way in lieu of silt fences or straw bales. Sediment barriers will also be installed within wetlands along the edge of the right-of-way, where necessary, to minimize the potential for sediment to run off the construction right-of-way and into wetlands outside the work area. If trench dewatering is necessary, it will be conducted in accordance with the Procedures and applicable permits. Silt-laden trench water will be discharged into an energy dissipation/sediment filtration device, such as a geotextile filter bag and straw bale structure in an upland location, to minimize the potential for erosion and sedimentation.

The method of pipeline construction used in wetlands will depend on site-specific weather conditions, soil saturation, and soil stability at the time of construction. If wetland soils are not excessively saturated at the time of construction and can support construction equipment on equipment mats, they will be crossed using conventional open-trench construction. This will occur in a manner similar to conventional upland cross-country construction techniques. In unsaturated wetlands, topsoil from the trenchline will be stripped and stored separately from subsoil.

Where wetland soils are saturated or in inundated lowlands areas where soils cannot support conventional pipe-laying equipment, the pipeline may be installed using the push-pull method. This method will involve stringing and welding the pipeline outside of the wetland and excavating and backfilling the trench using a backhoe supported by equipment mats. A prefabricated section of pipeline will be installed in the wetland by equipping it with buoys and pushing or pulling it across the water-filled trench. After the pipeline is floated into place, the floats will be removed and the pipeline will sink into place. In most cases, the pipeline will be coated with concrete or equipped with set-on weights to provide negative buoyancy. Once the pipeline is in place, the trench will be backfilled. The push-pull construction method minimizes the number of equipment passes, reducing wetland impacts and soil compaction in lowland areas. Additional details on this and other construction methods to be used in wetlands and waterbody crossings are provided in Sections 3.8.1 and 3.8.2.

The application of concrete coating will generally occur in contractor yards identified for the ACP. In areas where concrete coating of pipe is required within the construction right of way, the coating activities will occur in accordance with the SPCC Plan (see Appendix H).

Concrete coating activities will occur a minimum of 100 feet from wetlands, waterbodies and springs, and 300 feet from karst features.[4] Concrete-coated pipe will be installed after the concrete is dried and will not be dispersed when submerged in water. Concrete coating is used to create negative buoyancy along the pipeline when required for waterbody or wetland crossings if necessitated by site-specific conditions.

Because little or no grading will occur in wetlands, restoration of contours will be accomplished during backfilling. Prior to backfilling, trench breakers will be installed, where necessary, to prevent subsurface drainage of water from wetlands. Where topsoil is segregated, the subsoil will be backfilled first followed by the topsoil. Topsoil will be replaced to the original ground level leaving no crown over the trenchline. In areas where wetlands overlie rocky soils, the pipe will be padded with rock-free soil or sand before backfilling with native bedrock and soil. Wetlands which have been temporarily disturbed by construction activities will be restored to their pre-construction contours within 12 months of commencing the temporary impact's construction, unless otherwise approved by an authorized Norfolk District representative. Restoration of wetlands will occur according to the ACP Restoration and Rehabilitation Plan, included in Appendix I.

Norfolk District NWP 12 Utility Line Activities Specific Regional Condition #5. Stockpiling Material. (January 20, 2017 Norfolk District Public Notice for NWP 2017-2022 Program) states:

"Whenever possible, excavated material shall be placed on an upland site. However, when this is not feasible, temporary stockpiling is hereby authorized provided that:

a. All excavated material stockpiled in a vegetated wetland area is placed on filter cloth, mats, or some other semi-permeable surface. The material will be stabilized with straw bales, filter cloth, etc. to prevent reentry into the waterway.

b. All excavated material must be placed back into the trench to the original contour and all excess excavated material must be completely removed from the wetlands within 30 days after the pipeline has been laid through the wetlands area. Permission must be granted by the District Commander or his authorized representatives if the material is to be stockpiled longer than 30 days."

Equipment mats, gravel fill, and/or geotextile fabric will be removed from wetlands following backfilling within 30 days after the pipeline has been laid through the wetlands area unless otherwise approved by an authorized representative of the Norfolk District.

Where wetlands are located at the base of slopes, permanent slope breakers will be constructed across the right-of-way in upland areas adjacent to the wetland boundary. Temporary sediment barriers will be installed where necessary until revegetation of adjacent upland areas is successful. There will be a 30-foot corridor clear of deep-rooted vegetation and a

[4] In comments filed with the Commission, the Virginia Department of Game and Inland Fisheries said that in-stream use of concrete should be done only in dry conditions, allowing concrete to harden prior to returning stream flow.

10 foot corridor maintained as herbaceous per the FERC Procedures. Once revegetation is successful, sediment barriers will be removed from the right-of-way and disposed of at an approved disposal facility. Additional details on site revegetation can be found in the Restoration and Rehabilitation Plan, Appendix I.

3.9 ALTERNATIVES

For purposes of the USACE evaluation of single and complete projects, the "alternatives analysis" is to ensure that the crossing of each single and complete crossing of wetlands, streams, and other waters is made in a manner that avoids and minimizes impacts to the aquatic environment to the maximum extent practicable, after considering the approach to the crossing in the uplands immediately adjacent to those aquatic features. For example, to the extent practicable, crossings have been designed to be perpendicular to the aquatic feature to minimize the length of the pipeline in the particular aquatic system.

The FERC NEPA EIS process includes the evaluation of alternative route alignments that reduce the overall impacts on the human environment of the proposed pipeline including avoiding and minimizing impacts to wetlands, streams, and other waters. In addition, all crossings within the Norfolk District have been designed to meet NWP 12 criteria also resulting in further avoidance and minimization of impacts. The USACE is a cooperating agency on the FERC NEPA EIS and is working with FERC to ensure that USACE comments regarding the overall pipeline alternatives analysis are fully considered in that process. The fact that the ACP will be subject to an EIS does not preclude the use of NWP 12 for the affected waterbody single and complete projects. [5]

Information on the FERC alternatives analysis, including discussion of the various alternatives FERC is considering, is provided in the following section.

3.9.1 FERC NEPA ALTERNATIVES ANALYSIS DISCUSSION

Atlantic has compiled the information in this section as well as in Appendix E, FERC Construction Procedures. The detailed information and Plans are available through the FERC Project Docket (No. CP15-554-000) to all cooperating agencies, including the USACE. Within the sections below, the numbering of many of the referenced tables and figures has not been changed from their numbering in the FERC documentation, to maintain consistency across documents (e.g., Table 10.8.1-1, Figure 10.8.1-1, etc.). Atlantic has identified and evaluated a number of alternatives to the proposed ACP. These include a no-action alternative; alternative energy sources, including traditional and renewable sources; energy conservation measures; systems alternative; and conceptual collocation route alternatives.

5 As provided for in the USACE 2012 NWP FR final NWPs:
"One commenter requested clarification that individual permits are not automatically required for NWP 12 activities when a Corps district participates as a cooperating agency for an environmental impact statement. [Response] "Even though an environmental impact statement may be prepared for a particular utility line, the National Environmental Policy Act process does not prohibit the Corps from using NWP 12 to authorize the construction, maintenance, repair, and removal of utility lines and associated facilities in waters of the United States, as long as the activity complies with all applicable terms and conditions and results in minimal individual and cumulative adverse effects on the aquatic environment. NEPA requires consideration of all environmental impacts, not only those to aquatic resources, so there may well be situations where aquatic impacts are minimal even though environmental impacts more generally are not. These other environmental impacts would be addressed by the lead agency preparing the environmental impact statement." [77 FR, Vol 77, No. 34]

No Action Alternative

Under the no-action alternative, the ACP would not be built and the environmental impacts associated with construction and operation of the proposed facilities would not occur. By not constructing this Project, however, Atlantic would be unable to meet their existing customers' demands for natural gas and the projected demand by other industrial, commercial, and domestic customers (including power-generating facilities) in Virginia and North Carolina. The projected demand is due to a combination of population growth and displacement of coal-fired electric power generation. In addition, other benefits from the Project, such as future economic development opportunities, reduced energy costs in the region, and the repowering of coal-fired electric generation to gas-fired electric generation, would not be realized.

Under the no-action alternative, other natural gas transmission companies could propose to construct new facilities similar to the Project to meet the demand for new natural gas transportation service in Virginia and North Carolina. Such actions would likely result in impacts similar to or greater than those associated with the ACP, and might not meet the Project's objectives to satisfy demand from existing customers within the proposed time frames. For these reasons, the no-action alternative is not practical and provides no advantage over the ACP.

Alternative Energy Sources

The use of alternative energy sources is an option to meet some of the short-term and long-term demands for energy in the target market areas. Potential alternative energy sources to natural gas include traditional fuels, such as coal and oil, nuclear energy, and electricity (including electricity generated from oil, coal, and nuclear power); and renewable energy sources, such as wind, solar, hydroelectric, biomass, and tidal and wave. Like the ACP, all of these alternative energy sources, depending on the location of the source, would require new infrastructure, including transmission facilities, to connect supply and demand areas. Additional information regarding the analysis of alternative energy sources is available in Resource Report 10, Alternatives, filled with FERC as part of the licensing documentation, which is available through the FERC Project Docket (No. CP15-554-000) to all cooperating agencies, including the USACE.

Energy Conservation

Energy conservation could help alleviate some of the growing demand for energy in the United States and in the states/commonwealth to be serviced by the ACP. State/commonwealth and federal energy conservation measures will likely play an important role in slowing the growth of energy demand in the coming decades. However, it is unlikely that these measures will offset the demand for new natural gas sources. The EIA predicts that United States energy use per capita will decrease by approximately 8 percent through 2040, as higher efficiency standards for vehicles and appliances take effect. Nevertheless, the EIA indicates that, even with the recently enacted energy efficiency policies, total primary energy consumption, including fuels used for electricity generation, will grow by 8.9 percent from 2013 to 2040 (EIA, 2015f). To meet this demand, the EIA predicts that total domestic production of natural gas in the United States will grow from 24.4 trillion cubic feet in 2013 to 35.5 trillion cubic feet per year by 2040,

and that shale gas production will make up 53 percent of total United States production in 2040, up from 40 percent in 2012 (EIA, 2014). The anticipated growth in natural gas demand will be driven primarily by its increased use for electric power generation and industrial applications.

Reduction in the need for additional energy is the preferred option wherever possible. Conservation of energy reduces the demand for limited existing reserves. Although energy conservation measures will be important elements in addressing future energy demands, it is unlikely that they will be able to offset more than a fraction of anticipated demand in the foreseeable future. As a result, energy conservation alone (or in conjunction with other alternatives) is not a viable alternative because it does not preclude the need for natural gas infrastructure projects like the ACP to meet the growing demand for energy.

System Alternatives

System alternatives would make use of other existing, modified, or proposed pipeline systems to meet the same objectives as the ACP. Use of a system alternative would make it unnecessary to construct all or part of the ACP, though modifications or additions to existing or proposed systems could be required. The modifications or additions would result in environmental impacts that could be less than, similar to, or greater than those associated with the ACP.

Several existing, high-pressure, high-volume natural gas pipeline systems provide transportation services to delivery points in the Mid-Atlantic and southeast regions. These include Transco; Columbia Gas Transmission, LLC; and East Tennessee Natural Gas, LLC. Additionally, several new pipeline projects have been proposed to provide natural gas transportation service in the same regions, including the Spectra Energy Carolina Pipeline Project; Mountain Valley, LLC Mountain Valley Pipeline Project; and Transco Appalachian Connector Pipeline Project. Significant modifications to each of these systems would be necessary to access the same supply areas and/or provide transportation service to the same customers or at the same delivery points as the ACP. The environmental impacts associated with the upgrades and new pipeline construction modifying existing or proposed systems would likely be equal to or greater than those of the ACP. Therefore, the theoretical modifications to the existing systems or proposed systems would provide no environmental advantage over the ACP. For this reason, and the fact that the existing system does not meet the ACP's purpose and need, these system alternatives are not considered viable alternatives to ACP.

Conceptual Route Alternatives

Where practical, and depending on site-specific conditions, new natural gas transmission pipelines can sometimes be collocated with existing linear corridor facilities (e.g., other pipelines, electric transmission lines, highways, or railroads) to minimize impacts on environmental and other resources. A pipeline is considered collocated with an existing linear corridor facility if the new right-of-way for the pipeline is adjacent to or very near (within a few hundred feet) of the existing facility. A pipeline can parallel an existing linear corridor facility without being collocated with the existing facility, but this often results in multiple clear-cuts along similar paths with no reduction in impacts on environmental and other resources.

The three criteria listed below are generally used to identify and evaluate opportunities to collocate all or part of a new natural gas transmission pipeline adjacent to existing linear corridor facilities.

- The location and orientation of existing facilities relative to the new pipeline. The existing facilities must provide a relatively direct path between the proposed receipt and delivery points for the new pipeline. Otherwise, routing adjacent to these existing facilities increases the length of the pipeline, which results in greater environmental impact and added cost to the project.

- The nature of terrain along existing facilities. In some areas, the landforms crossed may not allow for the construction of a pipeline adjacent to an existing facility due to factors such as side slope, limitations on the amount of space available for new construction, or the orientation of landforms crossed.

- The nature of land uses along the existing facilities. Developed lands (including residential, commercial, and industrial lands) are often found along linear corridor facilities such as highways and railroads. Routing a new pipeline to avoid these developed areas often results in parallel (as opposed to adjacent) alignments and increases the length (and therefore the environmental impact and cost) of a new pipeline.

In addition to these conceptual alternatives, Atlantic evaluated potential collocation alternatives for the ACP and SHP in areas where existing pipelines, electric transmission lines, or roads either intersect or run parallel to and near the proposed Project. Potential route alternatives and variations adjacent to existing facilities which would meet the purpose and need of the ACP and avoid or minimize impacts are discussed below. Desktop review of other potential collocation route alternatives identified significant impediments with the routes with regard to terrain, existing developments, or increased length of the ACP.

Eastern and Western Conceptual Route Alternatives

During the initial planning stages for the ACP, Atlantic identified and evaluated two conceptual route alternatives: an eastern route alternative and a western route alternative (Figure 10.8.1-1). Both routes originate south of Clarksburg in West Virginia and terminate near Lumberton in North Carolina, with laterals extending to Hampton Roads in Virginia and Clayton in North Carolina. Comparative information on each route is provided in Table 10.8.1-1.

The eastern route alternative, including the laterals, measures approximately 538.0 miles in length, of which 22.6 miles is adjacent to existing linear corridor facilities. It crosses approximately 66.4 miles of Federal lands, including lands managed by the U.S. Forest Service (USFS), U.S. Fish and Wildlife Service (FWS), U.S. Army, and National Park Service (NPS). The eastern route crosses both the Blue Ridge Parkway and Appalachian Trail on Federal lands. The route crosses 2.8 miles of State/Commonwealth lands, 12.2 miles of conservation easements, 328 miles of forested land, 60.6 miles of wetland, and 362 perennial waterbodies. It additionally crosses 13.5 miles of areas identified as historic properties, historic landscapes, or historic landmarks, consisting mostly of Civil War battlefields.

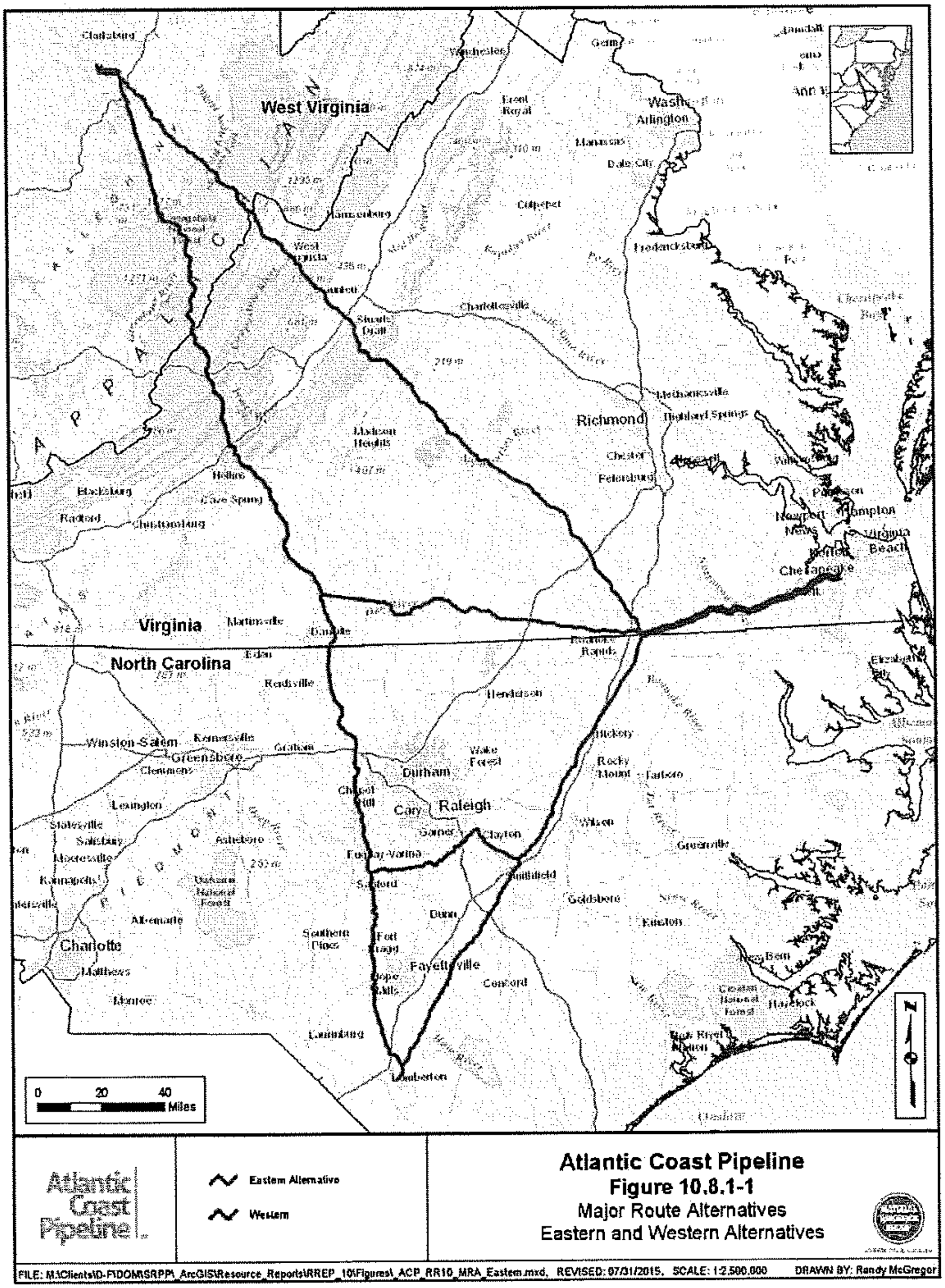
The western route alternative, including the laterals, measures approximately 607.2 miles in length, of which 16.8 miles is adjacent to existing linear corridor facilities. The route crosses 68.4 miles of Federal lands, including lands managed by the USFS, FWS, U.S. Army, USACE, and NPS. Like the eastern route alternative, the western route crosses both the Blue Ridge Parkway and Appalachian Trail on Federal lands. It crosses 7.0 miles of State/Commonwealth lands, 18.3 miles of conservation easements, 414.7 miles of forested lands, 45.7 miles of wetland, and 425 perennial waterbodies. It also crosses 10.4 miles of areas identified as historic properties, historic landscapes, or historic landmarks, mostly Civil War battlefields.

TABLE 10.8.1-1

Eastern and Western Route Alternatives for the Atlantic Coast Pipeline

Features	Unit	Eastern Route [a]	Western Route
Length	miles	538.0	607.2
Primary U.S. or State/Commonwealth highways crossed	number	115	103
Adjacent to existing linear corridor facilities	miles	22.6	16.8
Federal lands crossed (total)	miles	66.4	68.4
National Park Service	miles	0.6	0.4
U.S. Forest Service	miles	46.9	44.0
U.S. Fish and Wildlife Service	miles	7.2	7.2
U.S. Army	miles	11.7	14.0
U.S. Army Corps of Engineers	Miles	0.0	2.8
Blue Ridge Parkway crossings	Number	1	1
Appalachian Trail crossings	Number	1	1
State/Commonwealth lands crossed (total)	Miles	2.8	7.0
West Virginia	Miles	0.0	0.0
Virginia	Miles	0.2	0.0
North Carolina	Miles	2.6	7.0
Conservation easements crossed	Miles	12.2	18.3
Forested lands crossed	Miles	328.8	414.7
National Wetland Inventory wetlands crossed (total)	Miles	60.7	45.7
Forested	Miles	55.0	40.1
Emergent	Miles	4.7	4.0
Other	Miles	1.0	1.6
Intermittent waterbodies crossed	Number	342	481
Perennial waterbodies crossed	Number	362	425
Historic properties, historic landscapes, and historic landmarks crossed	Miles	13.5	10.4

[a] The eastern route alternate is similar, but not identical, to the baseline route for the ACP. The eastern route alternative was refined into the baseline route based on customer needs and identification of delivery points for the ACP.



Atlantic Coast Pipeline
Figure 10.8.1-1
Major Route Alternatives
Eastern and Western Alternatives

Relative to the eastern route alternative, the western route alternative is approximately 69.2 miles longer and crosses 2.0 more miles of Federal lands, including lands managed by the USACE, which the eastern route avoids. Both routes cross the Blue Ridge Parkway and Appalachian Trail on Federal lands. The western alternative crosses 4.2 more miles of State/Commonwealth land and 6.1 more miles of conservation easements than the eastern alternative. The western alternative crosses 15.0 miles less of wetland and 3.1 miles less of historic places, but 85.9 more miles of forested land and 63 more perennial waterbodies than the eastern route.

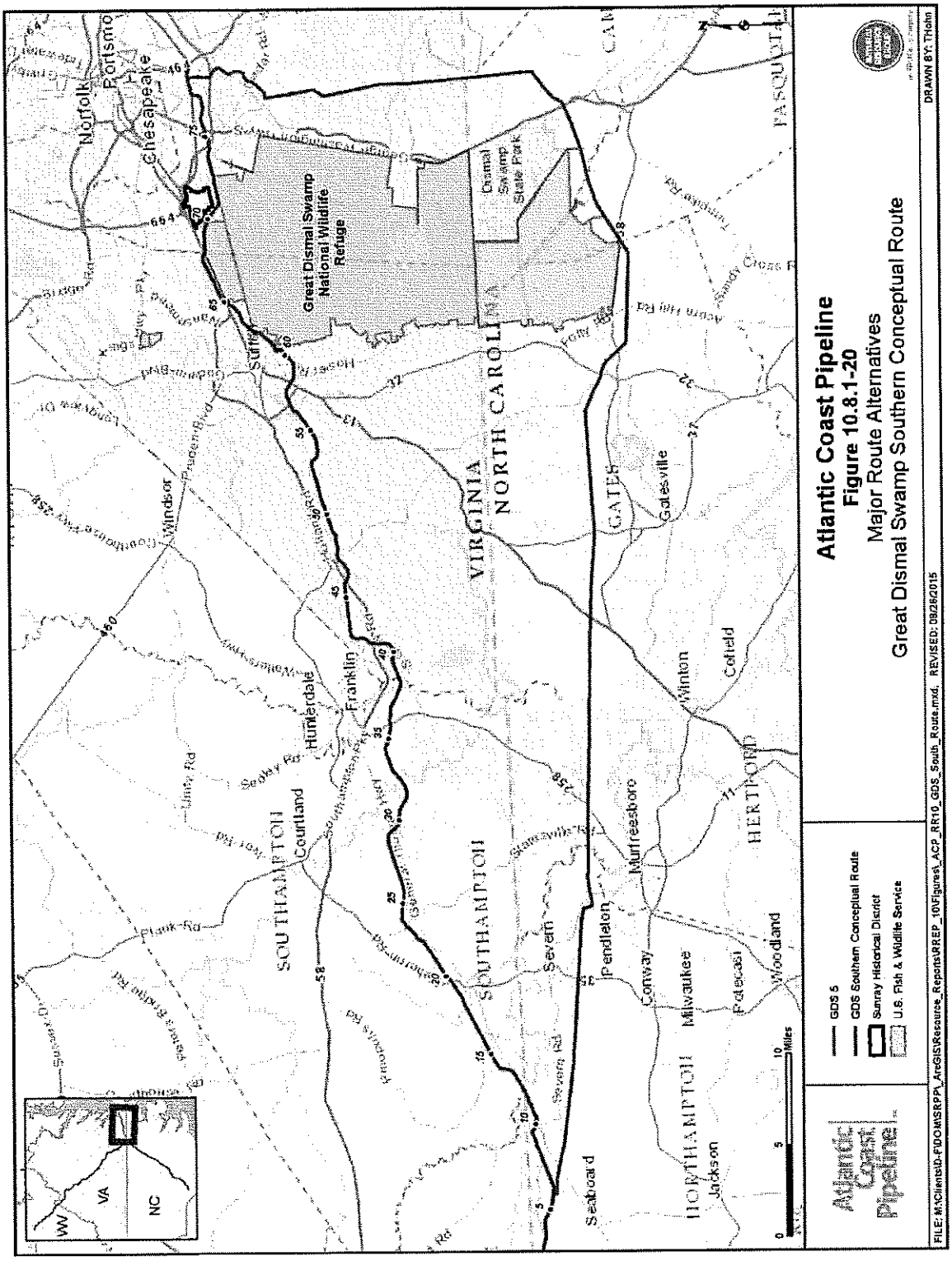
In addition, after the receipt and delivery points were confirmed for the ACP, it was determined that the western route alternative does not provide a direct connection to the delivery point in Randolph, County, West Virginia (i.e., the Long Run M&R Station), or to the receipt and delivery point in Buckingham County, Virginia (i.e., Compressor Station 2). Additional laterals would need to be built to reach these locations if the western route was selected as the preferred alternative. Depending on the routes selected, these laterals would add an additional 75 to 85 miles of pipeline to the ACP, which would result in greater environmental impact and additional cost.

For all these reasons, Atlantic identified the eastern route as the preferred alternative for the ACP. This route subsequently was refined into the baseline route for the ACP.

Southern Conceptual Route Alternative

The southern conceptual alternative route originates approximately at MP 6.0 of the currently proposed AP-3 lateral route in Northampton County, North Carolina (see Figure 10.8.1-20 below). From this point, the conceptual route heads due east for approximately 64 miles crossing Northampton, Hertford, Gates, Pasquotank, and Camden Counties, North Carolina, passing south of the Great Dismal Swamp National Wildlife Refuge (GDS-NWR) and Dismal Swamp State Park. The conceptual route then heads north for approximately 20 miles, crossing Camden County, North Carolina and the City of Chesapeake, Virginia, passing east of the GDS-NWR. The route terminates approximately at MP 79.2 of the GDS 1 route on the east side of the Southern Branch Elizabeth River. The conceptual route is approximately 13 miles longer than the corresponding segment of the GDS 1 route.

Although the southern conceptual route alternative avoids the GDS-NWR, construction along this route would result in an additional 13 miles of impacts, including crossings of many miles of wetlands along the Chowen River, in the area south of the Dismal Swamp State Park, and along the Pasquatank River. Based on National Wetlands Inventory data, the southern conceptual route crosses approximately 30.6 miles of wetlands, while the corresponding segment of the currently proposed route crosses approximately 20.1 miles of wetlands. The southern conceptual route additionally crosses large blocks of land identified by The Nature Conservancy (TNC) as sensitive floodplain forest in areas south and east of the GDS-NWR. Also, the southern conceptual route alternative is almost entirely a greenfield corridor, as there are no existing pipelines, electric transmission lines, railroads, or major roads to follow in the vicinity of the route. By contrast, the corresponding segment of the proposed route is collocated with existing linear corridor facilities for approximately 13 miles. Because the southern conceptual route is longer and would result in greater impacts than the currently proposed route, particularly to wetlands, the route is not considered a viable alternative.


Great Dismal Swamp National Wildlife Refuge
Dismal Swamp State Park
Norfolk
Portsmouth
Chesapeake
VIRGINIA
NORTH CAROLINA
SOUTHAMPTON
GATES
Windsor
Franklin
Courtland
Hunterdale
Gatesville
Winton
Colerain
Murfreesboro
Pendleton
Conway
Seaboard
Severn
Milwaukee
Woodland
Jackson
HERTFORD
NORTHAMPTON
Atlantic Coast Pipeline
Figure 10.8.1-20
Major Route Alternatives
Great Dismal Swamp Southern Conceptual Route
GDS 5
GDS Southern Conceptual Route
Survey Historical District
U.S. Fish & Wildlife Service
Miles
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3.9.2 Major Route Alternatives

As noted above, alternative alignments are being evaluated under the FERC EIS process. Those alternative alignments will affect the location and configuration of each single and complete project so background information on the FERC NEPA process is provided below.

Atlantic identified an initial or "baseline" route for the proposed ACP pipeline based on locations of receipt and delivery points, engineering and constructability criteria, terrain, and existing land use. Atlantic subsequently evaluated environmental and other constraints along each of the routes in an effort to refine the baseline configurations. Major route alternatives were identified based on a review of desktop constraints data, consultations and discussions with agency staff or other stakeholders, and field review in an effort to optimize the routes. For the purposes of this analysis, major route alternatives were defined as alignments that deviate substantially from the baseline route to avoid geographically broad or multiple environmental constraints or other sensitive areas. The major route alternatives typically measure greater than 5 miles in length and trend several miles away from the baseline route.

The major route alternatives were compared against the corresponding segment of the baseline route and either selected as offering environmental, constructability, or economic advantages, or rejected if no significant advantages were identified. The objective of the process was to identify the shortest possible route between the proposed receipt and delivery points taking into account the ACP purpose and need, engineering constraints, crossings of public lands, issues identified by stakeholders, minimization of impacts by collocating with existing rights-of-way or infrastructure, and the potential for impacts on sensitive environmental, tribal, and historical resources.

The primary criterion for comparing route alternatives to the baseline route was cumulative impact avoidance relative to the objective of the alternative. If selected, the route alternative was adopted as part of the proposed route, and the corresponding segment of the baseline route was rejected. Minor route variations (1 to 5 miles in length) were also identified as discussed in Section 3.9.4 below. Sections of the baseline route where no alternatives or variations were considered were adopted as the proposed pipeline route.

In some cases, all or portions of a major route alternative initially selected as preferred relative to the baseline subsequently were compared to newly identified alternative routes. In these cases, the route initially identified as preferred was considered the baseline for comparison to the new alternative route.

Atlantic has evaluated a number of major route alternatives for the entire project; the following sections provide details of those alternative routes in Virginia.

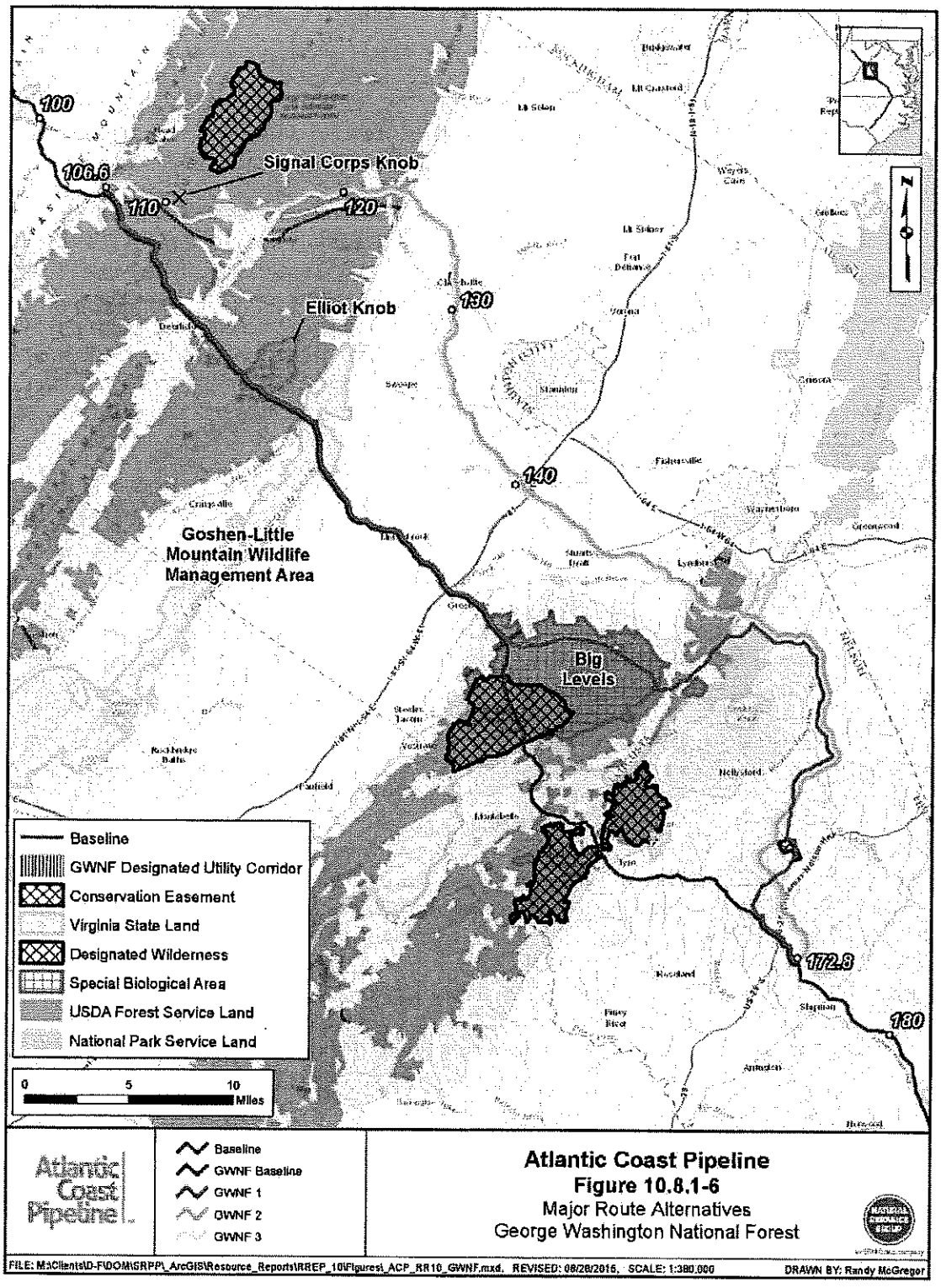
3.9.2.1 George Washington National Forest Major Route Alternatives

The GWNF encompasses over a million acres of Federal land in West Virginia and Virginia (USFS, 2014a). It contains portions of the Appalachian Trail as well as six federally designated Wilderness Areas and a number of backcountry recreation areas, special biological areas, and visually sensitive areas. The GWNF contains the headwaters of the Potomac and James River watersheds, and is the largest Federal land holding within the entire Chesapeake Bay watershed. Portions of the GWNF are managed for timber production and wood products.

Given the northwest-to-southeast orientation of the proposed AP-1 mainline between central West Virginia and southern Virginia, it is not feasible to avoid crossing the GWNF altogether. However, Atlantic identified and evaluated several route alternatives based on review of the *George Washington National Forest Revised Land and Resource Management Plan* (USFS, 2014b) and input from USFS staff in an effort to minimize the crossing length and avoid sensitive areas within the forest. In addition to the baseline, Atlantic identified three alternative routes (GWNF 1, GWNF 2, and GWNF 3) between approximately MPs 106.5 and 173.0 in Highland, Augusta, and Nelson Counties, Virginia. The baseline route and each alternative are depicted on Figure 10.8.1-6, and comparative information on each route is provided in Table 10.8.1-4. The routes are discussed in detail in the subsections below.

The plan identifies a designated utility corridor that is roughly parallel to and between approximately 0.1 and 1.0 mile to the south of the proposed AP-1 mainline route on the GWNF. This corridor contains an existing DVP 500 kilovolt electric transmission line. Atlantic evaluated the designated utility corridor as a potential route, but determined the terrain unsuitable for pipeline construction. The utility corridor traverses numerous steep side slopes and spans steep ravines which could not be crossed by a pipeline. Consequently, the designated utility corridor was rejected as a viable alternative route for the ACP.

Atlantic evaluated the possibility of a southern alternative corridor in an effort to avoid or minimize crossings of sensitive areas in the MNF. As described above, the conceptual route alternative initially follows the same alignment as MNF 5 to Thorny Flats, then heads southeast, crossing the GWNF, Blue Ridge Parkway, and Appalachian Trail near Montebello, Virginia, and rejoining the proposed route in the vicinity of Norwood, Virginia. In addition to constructability issues along the route due to terrain, environmental constraints associated with crossing the GWNF south of the proposed route appear to be insurmountable. The Conceptual Southern Route Alternative would require crossing large sections of special management areas in the GWNF, such as designated Wilderness Areas, potential wilderness areas, designated roadless areas, remote backcountry areas, and/or designated scenic areas. Atlantic's assessment of potential route corridors in the general vicinity of the Conceptual Southern Route Alternative determined that there is not a feasible route across the GWNF or Blue Ridge Parkway in this area.


100
106.6
110
120
130
140
172.8
180
Signal Corps Knob
Elliot Knob
Goshen-Little Mountain Wildlife Management Area
Big Levels
Baseline
GWNF Designated Utility Corridor
Conservation Easement
Virginia State Land
Designated Wilderness
Special Biological Area
USDA Forest Service Land
National Park Service Land
0
5
10
Miles
Atlantic Coast Pipeline
Baseline
GWNF Baseline
GWNF 1
GWNF 2
GWNF 3
Atlantic Coast Pipeline
Figure 10.8.1-6
Major Route Alternatives
George Washington National Forest
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DRAWN BY: Randy McGregor

TABLE 10.8.1-4

George Washington National Forest Major Route Alternatives for the Atlantic Coast Pipeline

Features	Unit	Baseline Route	GWNF 1 Route Alternative	GWNF 2 Route Alternative	GWNF 3 Route Alternative (proposed)
Length	Miles	58.8	68.4	68.7	69.1
Primary U.S. or Commonwealth highway crossed	Number	9	10	14	14
Other Commonwealth or local roads crossed	Number	54	64	75	79
Adjacent to existing linear corridor facilities	Miles	0.0	0.0	0.0	0.0
Federal lands crossed (total)	Miles	24.5	26.7	12.8	13.0
National Park Service (total)	Miles	0.6	0.7	0.5	0.5
Blue Ridge Parkway	Miles	0.6	0.2	0.2	0.2
Appalachian Trail corridor	Miles	0.0	0.5	0.3	0.3
U.S. Forest Service (total)	Miles	23.9	26.0	12.3	12.5
Commonwealth lands crossed	Miles	3.5	3.5	0.0	0.0
Private lands crossed	Miles	30.8	38.2	55.9	56.1
Conservation easements crossed	Miles	2.5	2.6	0.0	0.0
U.S. Forest Service management prescription units crossed (total)	Miles	23.9	26.0	12.3	12.5
Blue Ridge Parkway corridor	Miles	0.1	0.1	0.0	0.0
Designated wilderness	Miles	3.5	0.0	0.0	0.0
Dispersed recreation	Miles	0.0	1.2	0.0	0.0
Eligible recreation river corridor	Miles	0.2	0.0	0.0	0.0
Mosaics of wildlife habitat	Miles	10.3	10.7	12.3	12.5
Pastoral landscapes and rangelands	Miles	0.0	0.5	0.0	0.0
Remote backcountry	Miles	3.0	2.5	0.0	0.0
Scenic corridor and viewshed	Miles	1.6	0.3	0.0	0.0
Special biological area	Miles	5.2	10.7	0.0	0.0
Utility corridor	Miles	0.1	0.1	0.0	0.0
U.S. Forest Service roadless areas	Miles	2.5	3.5	0.0	0.0
U.S. Geological Survey karst topography crossing	Miles	13.1	20.2	26.3	26.3
Karst features crossed (sinkholes and cave entrances)	Number	1	1	17	17
Forested lands crossed	Miles	46.8	54.3	41.6	42.1
Wetlands crossed – freshwater emergent	Miles	<0.1	<0.1	0.1	0.1
Wetlands crossed – freshwater forested/shrub	Miles	<0.1	0.3	0.4	0.4
Intermittent waterbodies crossed	Number	23	52	68	69
Perennial waterbodies crossed	Number	24	41	39	38
McDowell Battlefield study area crossed	Miles	0.0	0.0	0.6	0.3

GWNF – Baseline

At 58.8 miles in length, the baseline route is the shortest of the four alternatives. Beginning at MP 106.5, the baseline initially heads southeast for approximately 33.0 miles, passing between Deerfield and West Augusta and east of Staunton, Stuarts Draft, and Waynesboro. At a point east of Greenville, the route turns south for approximately 15.0 miles, passing east of Montebello and north of Nash. It crosses the Blue Ridge Parkway approximately 7 miles south of Greenville, and the Appalachian Trail approximately 6 miles east of Montebello. At a point near Tyro, the route heads southeast for approximately 11.0 miles, terminating east of Lovingston.

The baseline route crosses approximately 23.9 miles of the GWNF, including 3.0 miles in the St. Mary's Wilderness Area and 0.5 mile in the Three Ridges Wilderness Area. As noted above, crossings of a Wilderness Areas require an authorization from the President. If such authorizations could be obtained at all, it would be infeasible to obtain them within the timeframe required by the purpose and need of the ACP. The baseline route additionally crosses management prescription units in the forest designated as special biological areas, scenic corridors and viewsheds, remote backcountry, and roadless areas. Atlantic understands that utility corridors generally are prohibited in these areas.

Outside the GWNF, the baseline route crosses 0.6 mile of NPS lands, including the Blue Ridge Parkway and Appalachian Trail; approximately 3.5 miles of Commonwealth lands in the Goshen-Little Mountain Wildlife Management Area (WMA); and approximately 2.5 miles of private lands subject to conservation easements held by the Virginia Outdoors Foundation (VOF). The baseline route crosses the fewest amount of wetlands and waterbodies, but the second most miles of forested land. At 13.1 miles, the baseline crosses the least amount of lands identified by the USGS as potentially containing karst, as well as crossing the fewest number of karst features (1) within 100 feet of the centerline as identified by the Virginia Department of Conservation and Recreation (VDCR).

GWNF 1

GWNF 1 is approximately 68.4 miles long, which is 9.6 miles longer than the baseline. It follows the same alignment as the baseline for approximately 32.0 miles, then heads east-northeast for approximately 17.0 miles to avoid crossing the St. Mary's and Three Ridges Wilderness Areas. The route crosses the Blue Ridge Parkway and Appalachian Trail approximately 3.0 miles south of I-64 at Afton Mountain. In Rockfish Valley, the route turns south and continues for approximately 32.0 miles, where it intersects the baseline near Woods Mountain in Nelson County. It then follows the same alignment as the baseline to the terminus approximately at MP 173.0, east of Lovingston.

GWNF 1 crosses approximately 26.0 miles of GWNF lands, including areas designated as remote backcountry, scenic corridors and viewsheds, special biological areas, and roadless areas. One of the special biological areas, Elliott Knob, provides habitat for several sensitive species, including the cow knob salamander, which is protected under a special conservation agreement between the USFS and the FWS. Another special biological area, Big Levels, contains unique groundwater features, vernal pools, dense concentrations of prehistoric archaeological sites, as well as habitat for several sensitive species. Staff from the GWNF recommended avoiding these areas.

Outside the national forest, GWNF 1 crosses approximately 0.7 mile of NPS land at the Blue Ridge Parkway and Appalachian Trail; 3.5 miles of Commonwealth land in the Goshen-Little Mountain WMA; and 2.6 miles of private land subject to conservation easements held by the VOF and Virginia Department of Forestry. It crosses more wetlands and waterbodies than the baseline route, but less than the other alternatives. It also crosses the most forested land, but the second fewest lands identified by the USGS as potentially containing karst topography, and the fewest number of karst features (1) within 100 feet of the centerline.

GWNF 2

GWNF 2 is approximately 68.7 miles long, which is 9.9 miles longer than the baseline. Starting at MP 106.5, the route initially heads east for approximately 16.0 miles, passing north of West Augusta. It then heads south-southeast for approximately 34.0 miles, passing north of Stuarts Draft and south of Staunton and Waynesboro. Like GWNF 1, it crosses the Blue Ridge Parkway approximately 3.0 miles south of I-64 at Afton Mountain. After crossing Rockfish Valley Road, the route heads south for another 19 miles, passing east of Wellsford and Lovingston, and terminating at MP 173.0.

GWNF 2 crosses approximately 12.3 miles of USFS lands, all within the mosaic of wildlife habitat management prescription unit. Based on discussions with USFS staff, lands within this management prescription unit would be considered suitable for a utility crossing of the national forest. Relative to GWNF 1, the ronte avoids the Elliott Knob and Big Level special biological areas and designated roadless areas, but crosses approximately 0.6 mile of the study area for the McDowell Battlefield site. It additionally crosses Signal Corps Knob, which USFS staff identified as an important site used as a signal station by both the Union and Confederate Armies during the Civil War.

Outside the national forest, GWNF 2 crosses approximately 0.5 mile of NPS land at the Blue Ridge Parkway and Appalachian Trail, but avoids the Goshen-Little Mountain WMA as well as crossings of conservation easements. It crosses the same amount of wetlands and waterbodies as GWNF 3, hut crosses more waterbodies than the baseline and GWNF 1 route alternatives. It also crosses the least amount of forested land, but the most lands identified by the USGS as potentially containing karst topography and the most sinkhole and cave entrances within 100 feet of the centerline, as identified by the VDCR. Potential karst impacts are the same of GWNF 3.

GWNF 3

GWNF 3 has a total length of 69.1 miles, which is 10.3 miles longer than the baseline route. It follows the same alignment as GWNF 2, with the exception of a short segment between MPs 107.7 and 114.2, where it passes approximately one mile to the south in the vicinity of Signal Corps Knob. GWNF 3 crosses 12.5 milcs of USFS lands, all within the mosaic of wildlife habitat management prescription unit. Like GWNF 2, the route avoids the Elliot Knob and Big Level special biological areas and designated roadless areas. It also avoids the Civil War site on Signal Corp Knob and crosses 0.3 mile less of the McDowell Battlefield site.

As originally conceived, GWNF 3 crossed the Blue Ridge Parkway and Appalachian Trail 0.5 mile of NPS lands. As explained in Section 10.8.1.5, Atlantic subsequently modified the route to cross the Appalachian Trail on lands owned and administered by the GWNF as part of the Appalachian Trail South Major Route Alternative. The route avoids the Goshen-Little Mountain WMA and conservation easements, crosses the same amount of wetlands and waterbodies as GWNF 2, and crosses just 0.5 more mile of forested land. It crosses the most lands identified by the USGS as potentially containing karst topography and the most sinkhole and cave entrances within 100 feet of the centerline, as identified by the VDCR. Potential karst impacts are the same as GWNF 2.

GWNF Alternative 6

Atlantic has identified an alternative route for the proposed AP-1 mainline that avoids Cheat Mountain, Back Alleghany Mountain, Shenandoah Mountain, and other sensitive public and resource areas within the MNF and GWNF. The alternative route, referred to as GWNF 6, additionally addresses issues identified by the USFS in a letter to Atlantic dated January 19, 2016 with regard to Cheat Mountain Salamander, West Virginia Northern Flying Squirrel, and Cow Knob Salamander (FERC Accession Number 20160121-5029). While Atlantic believes that its originally filed route is consistent with the applicable Land and Resource Management Plans for the MNF and GWNF, the alternative route avoids occupied or suitable habitat for the Cheat Mountain Salamander and West Virginia Northern Flying Squirrel in the MNF and for the Cow Knob Salamander in the GWNF. The GWNF 6 route is approximately 95.7 miles long. Approximately 3.9 miles of the route are adjacent to existing utility rights-of-way, roads, or trails or within previously disturbed strip mine areas. The route crosses 21 primary highways, including U.S. Highways 219 and 220, and 63 secondary highways or local roads. The route crosses 12.1 miles of Federal lands managed by the USFS, including 5.4 miles in the MNF and 6.7 miles in the GWNF; 4.6 miles of State lands in West Virginia in the Seneca State Forest; and 79.0 miles of private lands. The route crosses 256 parcels of land (including public lands), of which nine parcels (approximately 6.7 miles) are encumbered by open space conservation easements held by the VOF.

Atlantic has adopted GWNF 6 as part of the route for the AP-1 mainline. Atlantic has consulted with the USFS and other Federal and State/Commonwealth agencies and conducted environmental studies to characterize existing conditions, assess the potential for impacts on sensitive resources, and identify measures for avoiding, minimizing, and mitigating impacts along GWNF 6. Field surveys and studies completed along the route include wetland and waterbody delineation surveys, threatened and endangered species surveys, archaeological and historic site surveys, a karst assessment and survey, an Order 1 soil survey within the MNF and GWNF, a geohazards assessment, and a visual impacts assessment for the MNF and GWNF.

3.9.2.2 Great Dismal Swamp Major Route Alternatives

The GDS-NWR is an approximately 112,000-acre preserve in southeastern Virginia and northeastern North Carolina managed by the FWS. The refuge encompasses a remnant of a larger swamp forest ecosystem that used to cover much of the surrounding area (FWS, 2014).

To meet its commitments to customers as specified in precedent agreements for the ACP, Atlantic is proposing to provide transportation service to various shippers at a new delivery point in the City of Chesapeake, Virginia via the proposed AP-3 lateral. Options for routing a new pipeline into this area are limited due to urbanization in and around the Cities of Suffolk and Chesapeake, which have built out to the northern boundary of the GDS-NWR. Atlantic identified an initial baseline route that avoids developed areas in the cities and minimizes impacts on the GDS-NWR by routing along the northern interior boundary of the refuge in an area containing existing electric transmission and pipeline facilities on the south side of U.S. Highway 13 (Portsmouth Boulevard). Portions of the route in this area parallel existing electric transmission or pipeline facilities within the refuge.

Atlantic met with staff from the GDS-NWR on June 30 and August 21, 2014 to review the proposed baseline route across the refuge. The meeting on June 30, 2014 included a field visit to various points along the baseline route both within the refuge and in the City of Suffolk, Virginia. Based on information from GDS-NWR staff, specifically that the route should minimize crossings of Federal lands and be adjacent to existing utilities, Atlantic identified and evaluated an alternative route (GDS 1) across the refuge. The route alternative incorporated specific recommendations from GDS-NWR staff regarding the configuration of the route along White Marsh Road in the City of Suffolk, Virginia.

In subsequent communications, GDS-NWR staff asked Atlantic to identify and evaluate an alternative route which avoids the refuge altogether. In response to this request, Atlantic identified two alternative routes (GDS 2 and GDS 6) which avoid the refuge by passing north of the City of Suffolk. Atlantic additionally identified three alternative routes (GDS 3, GDS 4, and GDS 5) which reduce the crossing length of the refuge by passing north of U.S. Highway 13 between the communities of Magnolia and Bowers Hill. Atlantic also identified and assessed a conceptual route alternative going south of the refuge.

In addition to the baseline, six alternative routes were identified by Atlantic in the vicinity of the GDS-NWR. Each of these routes originates approximately at MP 49.7 of the baseline AP-3 lateral route in the City of Suffolk and terminates approximately at MP 75.0 in the City of Chesapeake. Atlantic's initial baseline route and comparative data on each route are provided in Table 10.8.1-18.

TABLE 10.8.1-18

Great Dismal Swamp Route Alternatives for the Atlantic Coast Pipeline

Features	Unit	Baseline	GDS 1	GDS 2	GDS 3	GDS 4	GDS 5	GDS 6 (Proposed)
Length	miles	24.7	25.0	28.4	27.7	27.9	25.1	29.2
Primary U.S. or Commonwealth highway crossed	number	5	5	11	12	12	9	11
Other Commonwealth or local roads crossed	number	14	22	22	25	24	18	14
Adjacent to existing linear corridor facilities	miles	11.5	11.9	1.6	8.0	8.5	14.1	9.5
Federal lands crossed (GDS-NWR)	miles	7.2	4.8	0.0	1.1	0.6	1.7	0.3
Commonwealth lands crossed	miles	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Private lands crossed	miles	17.5	20.2	28.4	26.6	27.3	23.4	28.9
Sunray Historic District lands crossed	miles	0.0	2.1	1.6	1.6	1.6	0.0	0.0
Battlefield study area crossed – Suffolk II	miles	7.1	7.5	3.4	8.7	8.8	7.5	3.4
Conservation easements crossed	miles	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Forested lands crossed	miles	17.1	15.8	15.4	19.0	19.0	18.0	17.7
Wetlands crossed – total	miles	12.9	9.1	7.7	9.8	11.1	11.2	12.3
Wetlands crossed – freshwater emergent/open water	miles	0.7	0.2	0.5	0.3	0.2	2.1	2.2
Wetlands crossed – freshwater forested/shrub	miles	12.2	9.0	6.2	9.5	10.9	9.2	9.1
Wetlands crossed – Estuarine and Marine	miles	0.0	0.0	1.0	0.0	0.0	0.0	1.0
Waterbodies crossed – total	number	50	48	66	59	60	58	62
Intermittent waterbodies crossed	number	3	3	11	6	6	1	8
Perennial waterbodies crossed	number	6	7	11	15	14	7	6

TABLE 10.8.1-18

Great Dismal Swamp Route Alternatives for the Atlantic Coast Pipeline

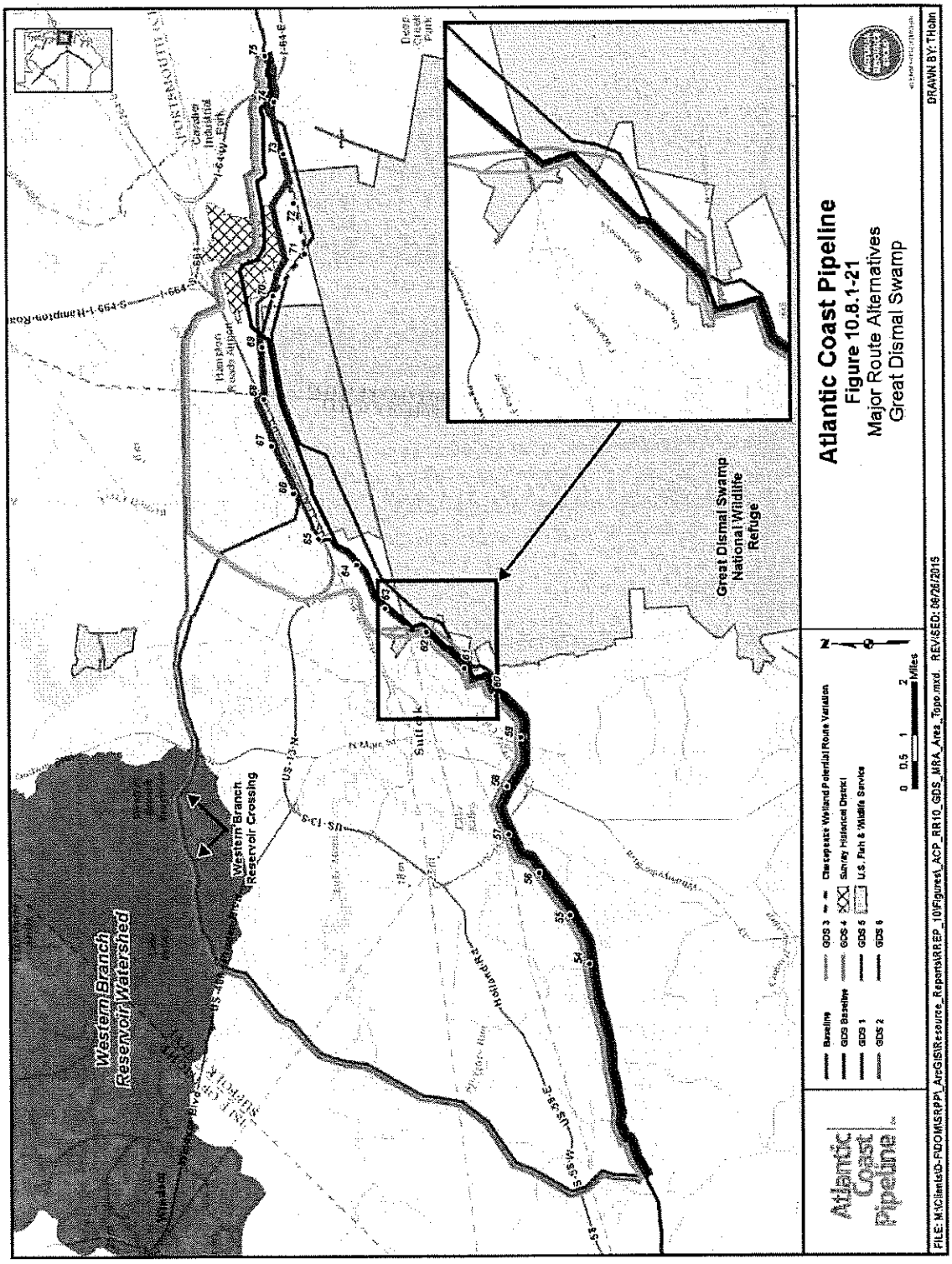
Features	Unit	Baseline	GDS 1	GDS 2	GDS 3	GDS 4	GDS 5	GDS 6 (Proposed)
Canal/Ditch/Artificial Path crossed	number	41	38	44	38	40	50	48
Source Water Watershed – Western Branch Reservoir	miles	0.0	0.0	4.5	0.0	0.0	0.0	4.5
Navigable Waters	number	0	0	2	0	0	0	2

Subsequent to identifying the baseline and alternative routes for the GDS-NWR, Atlantic adopted the Franklin Major Route Alternative, as described below. The Franklin Major Route Alternative modifies the first 3.9 miles of the baseline and all GDS alternative routes by shifting the route adjacent to an existing utility corridor. For the purposes of this analysis, Atlantic used part of the Franklin Baseline Route as the proposed route in this analysis.

Baseline Route

At 24.7 miles, the baseline is the shortest of the seven alternative routes (Figure 10.8.1-21). Starting at MP 49.7, the route extends to the east-northeast for approximately 7.8 miles to a point east of Lake Kilby. It then continues to the east-northeast for another 4.5 miles, passing south and east of Suffolk and entering the GDS-NWR east of White Marsh Road. The route then extends east for 6.3 miles crossing the refuge on the south side of U.S. Highway 13 and exiting the refuge at a point just east of the Suffolk/Chesapeake City line. The route then continues east for approximately 6.1 miles, where it reaches approximate MP 75.0, about 0.5 mile east of I-64.

The baseline route crosses approximately 7.2 miles of Federal lands in the GDS-NWR, including 4.3 miles which are adjacent to existing electric transmission or pipeline facilities. In total, approximately 11.5 miles (47 percent) of the baseline is collocated with existing linear corridor facilities, which is the second highest percentage of the routes considered. The baseline crosses the most miles of wetlands (by 0.6 mile) and fifth most miles of forested land, but the second fewest number of waterbodies and the fewest roads. It crosses approximately 7.1 miles of the Suffolk II battlefield study area, but avoids the Sunray Historic District, which is listed in the National Register of Historic Places. The route also avoids crossings of conservation easements and navigable waters.


Western Branch Reservoir Watershed
Western Branch Reservoir Crossing
Great Dismal Swamp National Wildlife Refuge
Atlantic Coast Pipeline
Figure 10.8.1-21
Major Route Alternatives
Great Dismal Swamp
Baseline
GDS Baseline
GDS 1
GDS 2
GDS 3
GDS 4
GDS 5
GDS 6
Chesapeake Wetland Potential Route Variation
Surrey Historical District
U.S. Fish & Wildlife Service
Miles
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GDS 1 Route Alternative

GDS 1 measures 25.0 miles in length, which is the second shortest of the seven alternative routes. Starting at MP 49.7, the route extends to the east-northeast for approximately 7.8 miles to a point east of Lake Kilby. It then continues to the east-northeast for another 4.5 miles, passing south and east of Suffolk. After crossing White Marsh Road, it turns north for approximately 0.3 mile, and then heads east for 0.2 mile, where it crosses Jericho Ditch Lane and enters the refuge east of White Marsh Road. The route then extends east for 6.3 miles crossing the refuge on the south side of U.S. Highway 13 and exiting the refuge at a point just east of the Suffolk/Chesapeake City line. The route then continues east for about 6.0 miles, where it reaches approximate MP 75.0, about 0.5 mile east of I-64.

GDS 1 crosses approximately 4.8 miles of Federal land in the GDS-NWR, of which 3.8 miles is adjacent to existing utilities. In total, approximately 11.9 miles (48 percent) of the route is adjacent to existing electric transmission or pipeline facilities, which is the highest percentage for the routes considered. GDS 1 crosses the second fewest miles of wetlands and forested lands, the fewest number of waterbodies, and third fewest roads. It avoids conservation easements and navigable waters. The route crosses approximately 7.5 miles of the Suffolk II battlefield study area as well as 2.1 miles of the Sunray Historic District, which is more than the other routes.

GDS 2 Route Alternative

GDS 2 measures approximately 28.4 miles in length, which is 3.7 miles longer than the baseline. Starting at MP 49.7, the route heads north-northeast for approximately 9.9 miles to a point just north of Pruden Boulevard in Suffolk. It then heads east for approximately 12.0 miles, passing north of Suffolk and crossing two short segments of the Western Branch Reservoir, which is a water supply source for the City of Norfolk. After passing north of the Hampton Roads Airport, GDS 2 turns south-southeast for approximately 2.0 miles, crossing U.S. Highway 13. It then follows the same alignment as GDS 1 for 4.4 miles east to approximate MP 75.0.

GDS 2 avoids the refuge, but is the second longest of the seven alternative routes by between 0.5 and 3.7 miles. It is adjacent to existing electric transmission or pipeline facilities for 1.6 miles (6 percent), which is less than the other routes. GDS 2 crosses the fewest miles of forested land and the fourth fewest roads. It crosses the fewest miles of wetlands, but is one of only two routes, along with GDS 6, which crosses wetlands characterized as estuarine/marine. The route crosses the most waterbodies, including two which are classified as navigable waters (Nansemond River and Western Branch), and two which are finger lakes to the Western Branch Reservoir. The route additionally is within the watershed of the reservoir for 4.5 miles. It crosses the fewest miles of the Suffolk II battlefield study area but the second most miles of land in the Sunray Historic District. Like the other routes, it avoids conservation easements.

Based on competing constraints in the vicinity of GDS 2, primarily houses, it is not possible to avoid the reservoir or its watershed. If technically feasible, the crossings of the

reservoir would be accomplished by HDD, which would involve pulling a prefabricated section of pipe through a hole drilled beneath the crossings.

GDS 3 Route Alternative

GDS 3 measures approximately 27.7 miles in length, which is 3.0 miles longer than the baseline. It combines portions of GDS 1 and GDS 2 to reduce the crossing length of the refuge relative to GDS 1. It follows the same alignment as GDS 1 for approximately 12.7 miles to a point in the refuge just south of the Norfolk Southern Railroad. It then heads north for approximately 5.1 miles, crossing U.S. Highway 13 east of Magnolia and intersecting GDS 2 south of Robin Hood Trail. It then follows the same alignment as GDS 2 to the terminus of the route alternative at MP 75.0.

GDS 3 crosses approximately 1.1 miles of the GDS-NWR, which is 3.7 miles less than GDS 1. It is adjacent to existing electric transmission or pipeline facilities for approximately 8.0 miles (29 percent), including 0.5 mile within the refuge. GDS 3 crosses the fifth most miles of wetlands, and the fourth most number of waterbodies. It also crosses the most miles of forested land and most number of roads, including primary highways. Like the baseline and GDS 1, it avoids conservation easements and navigable waters. GDS 3 crosses 1.2 more miles of the Suffolk II battlefield study area but 0.5 mile less of the Sunray Historic District than GDS 1.

GDS 4 Route Alternative

At 27.9 miles in length, GDS 4 is 3.2 miles longer than the baseline. It is similar to GDS 3 but reduces the crossing length of the refuge by paralleling a short segment of Jericho Ditch Lane and crossing a parcel of Commonwealth owned land within the boundaries of the refuge. GDS 4 initially follows the same alignment as GDS 3 for approximately 10.9 miles to an intersection with Jericho Ditch Lane. It then parallels the north side of the lane for 0.5 mile, before heading north for 2.5 miles to a point south of East Washington Street in Suffolk. It then follows the same alignment as GDS 3 for 14.0 miles to the terminus of the route alternative at MP 75.0.

GDS 4 crosses approximately 0.6 mile of the GDS-NWR, which is 0.5 mile less than GDS 3. It is adjacent to existing linear corridor facilities for approximately 8.5 miles (30 percent), none of which is in the refuge. It crosses the fourth most miles of wetland, the most forested land (with GDS 3), and the third most waterbodies, though none of the waterbodies are classified as navigable. The route crosses the second most number of roads, including 12 primary highways. GDS 4 crosses the most miles within the Suffolk II battlefield study area and second most miles in the Sunray Historic District. Like the other routes, it avoids conservation easements.

GDS 5 – Proposed Route

GDS 5 is 25.1 miles in length, which is 0.4 mile longer than the baseline. It follows the same alignment as GDS 1 for the first 14.9 miles. Approximately at MP 64.8, GDS 5 heads north and crosses U.S. Highway 13. The route then turns to the east and parallels the north side

of the highway for 2.9 miles. At a point about 0.5 mile west of the Hampton Roads Airport, the route crosses to the south side of U.S. Highway 13, and follows an existing utility corridor to the east and southeast along the south side of the Sunray Historic District. This area is a forested wetland owned by the Chesapeake Wetland Mitigation Bank, LLC. GDS 5 then follows the Norfolk Southern Railroad for approximately 1.4 miles, before heading south and then east to the terminus of the route alternative at MP 75.0.

GDS 5 crosses approximately 1.7 miles of the GDS-NWR, which is 5.5 miles shorter than the baseline. It is adjacent to existing electric transmission, pipeline, or railroad facilities for approximately 14.1 miles (56 percent), which is the most of the alternatives. This includes approximately 1.5 miles within the refuge. GDS 5 crosses the third most miles of wetland and the third most miles of forested land. The route crosses the third fewest number of waterbodies, the fourth fewest miles of the Suffolk II battlefield study area, and avoids the Sunray Historic District. Like the other alternatives, the route avoids conservation easements.

GDS Alternative 6

GDS 6 measures approximately 29.2 miles in length, which is 4.5 miles longer than the baseline, and is the longest route alternative. It follows the same alignment as GDS 2 for the first 15.9 miles. Just east of the Nansemond River, GDS 6 heads to the southeast along an existing electric transmission line corridor for approximately 2.0 miles before it turns south for approximately 1.6 miles. It then joins with GDS 5 from MP 65.8 to MP 69.2, where it continues to the east on the north side of the GDS-NWR boundary. Approximately 0.2 mile west of the Sunray Historic District boundary, the route heads to the south and follows GDS 5 to the terminus at MP 75.0.

GDS 6 crosses approximately 0.3 mile of the GDS-NWR, which is the second shortest crossing of the alternatives. It is adjacent to existing electric transmission, pipeline, or railroad facilities for approximately 9.5 miles (33 percent), which is the fourth most of the alternatives. It crosses the second most miles of wetland, the fourth most forested land, and the second most waterbodies. Similar to GDS 2, the route crosses approximately 4.5 miles of the Western Branch Reservoir watershed, and it crosses two navigable waterways. The route crosses the fewest miles of the Snffolk II battlefield study area, avoids the Sunray Historic District, and avoids conservation easements. Like GDS 5, the route crosses the forested wetland owned by Chesapeake Wetland Mitigation Bank, LLC.

All seven GDS alternatives cross the City of Suffolk, Virginia. The City of Suffolk requested in a comment letter dated January 13, 2015 that the pipeline avoids areas designated as central urban/suburban growth areas under the City of Suffolk 2026 Comprehensive Plan. These designated central urban/suburban growth areas are located within the Highway 13 loop around the City of Suffolk, bordered by the GDS to the southeast. GDS 2 and GDS 6 are the only alternatives that avoid these areas. However, the baseline route, GDS I, GDS 3, GDS 4, and GDS 5 are all located near the southern boundary of the central growth area.

GDS Route Selection

While there are advantages and disadvantages to each route, based on the discussion above, Atlantic identified GDS 5 as the proposed route. This route reduces the crossing length of the GDS-NWR by 5.5 miles relative to the baseline. Most of the proposed route across the GDS-NWR is adjacent to an existing electric transmission line. In total, GDS 5 is adjacent to existing linear corridor facilities for approximately 14.1 miles (56 percent), which is the most of the alternatives. It also avoids the Sunray Historic District.

Atlantic is evaluating alternatives that would combine portions of the above referenced alternatives, as well as minor variations of these routes (both baseline and alternatives) with the intent of further minimizing the crossing of or avoiding the GDS-NWR. As stated above, Atlantic has identified GDS 5 as the proposed route, however given the complexities of competing constraints near the GDS-NWR, Atlantic continues to study and assess route alternatives in this area which includes coordinating with the Norfolk District Interagency Review Team for those alternatives that involve crossing of the Chesapeake Wetland Mitigation Bank.

3.9.2.3 Mingo Route Alternative

Atlantic identified and evaluated a route alternative along GWNF 6 between MP 60.2 and 68.1 of the AP-1 mainline in order to improve the crossing of Valley Fork and Valley Fork Road, to reduce the number of landowners impacted, to avoid a planned subdivision, and to avoid potential cultural resources near Mingo Flats. The corresponding segment of the filed route and new route alternative is referred to as the Mingo Route Alternative.

The corresponding segment of the filed route extends to the southeast for 0.8 mile, along the south side of Point Mountain, and across Redlick Run and Valley Fork Road. On the south side of Valley Fork Road, the proposed route would parallel Valley Fork for 0.3 mile, then cross Valley Fork and follow a southeast trend for 4.1 miles along the north side of Elk Mountain. The proposed route would then head generally south for 5.8 miles, crossing Mingo Flats, Mingo Run, Valley Mountain, and Dry Fork, before terminating on top of Middle Mountain at MP 68.1.

The Mingo Route Alternative initially heads south for 1.4 miles, coming down from Point Mountain, crossing Valley Fork, and climbing the north side of Elk Mountain. It then follows the ridgeline of Elk Mountain to the southeast for 4.7 miles, of which approximately 1.6 miles is previously cleared former strip mines on top of Elk Mountain. It then heads to the south, crossing Mingo Run east of Mingo Knob, then crossing Douglas Fork, Valley Mountain, and Dry Fork before reconnecting with the filed route at MP 68.1 on top of Middle Mountain.

The Mingo Route Alternative is 1.0 mile shorter than the filed route. At the most, the Mingo Route Alternative is 1.6 miles from the filed route. The route alternative also has approximately 1.6 miles of collocation with existing linear corridors, as it follows two previously cleared former strip mines on top of Elk Mountain, while the filed route does not have any collocation. In addition to the reduced length and the increased collocation, the Mingo Route Alternative reduces the number of properties crossed from 42 along the filed

route to 21 along the route alternative, and the route alternative is not located within 50 feet of any houses, while the filed route would be located within 50 feet of one house.

The Mingo Route Alternative reduces the number of intermittent waterbodies crossed by six, and the number of perennial waterbodies crossed by two. However, the Mingo Route Alternative crosses 0.2 more mile of forested land than the filed route. The Mingo Route Alternative reduces impacts on sensitive soils and USGS karst topography areas. The Mingo Route Alternative reduces crossings of hard shallow bedrock by1.6 miles, soft shallow bedrock by 0.2 mile, land considered highly erodible by water by 1.3 miles, and lands with revegetation concerns by 1.4 miles. The route alternative also reduces the amount of steep slope areas crossed by 0.8 mile, and the amount of steep side slope areas crossed by 0.2 mile.

In addition to the environmental advantages described above, the Mingo Route Alternative improves the crossing location of Valley Fork Road. Near MP 60.7, the filed route would head south down a steep slope, with Redlick Run and Valley Fork Road located at the bottom of the slope. Due to this steep slope and a lack of open areas for construction workspace, this road crossing would need to be relocated in order to be safely constructed. The Mingo

The Mingo Route Alternative avoids the crossing of Redlick Run, and it is located in an area with sufficient space to safely cross Valley Fork Road. While the Mingo Route Alternative presents a minor increase in the amount of forested land crossed, it reduces the overall pipeline length, the number of landowners affected, waterbody crossings, and impacts on sensitive soils and steep slopes. Therefore, Atlantic incorporated the Mingo Route Alternative into the filed AP-1 mainline route.

3.9.2.4 Meherrin River Major Route Alternative

In a letter dated September 8, 2014, and in a meeting on November 12, 2014, TNC asked Atlantic to consider an alternative route for the proposed AP-3 lateral to avoid or minimize crossings of the Meherrin River and Fountains Creek watersheds in southeastern Virginia. These watersheds are part of TNC's Albemarle Sound Whole System project area, which encompasses approximately 6 million acres of freshwater-dominated estuarine habitat in southeastern Virginia and northeastern North Carolina. TNC states that the Albemarle Sound System contains "areas of large intact wetland forest that support high levels of use by migratory and breeding birds and buffer some of the best migratory fish spawning and nursery habitats on the East Coast." TNC has worked with public agencies, corporations, landowners, and communities to protect and restore public and private lands in this area.

The baseline route for the AP-3 lateral crosses floodplain forest in the Meherrin River and Fountains Creek watersheds between MPs 0.0 and 12.0, including areas which TNC has recommended for avoidance (Figure 10.8.1-16). Atlantic identified and evaluated a route alternative which avoids Fountains Creek altogether and minimizes crossings of floodplain forest in areas recommended by TNC for avoidance. Atlantic's initial baseline route and comparative data on the alternate route are provided in Table 10.8.1-14.

TABLE 10.8.1-14

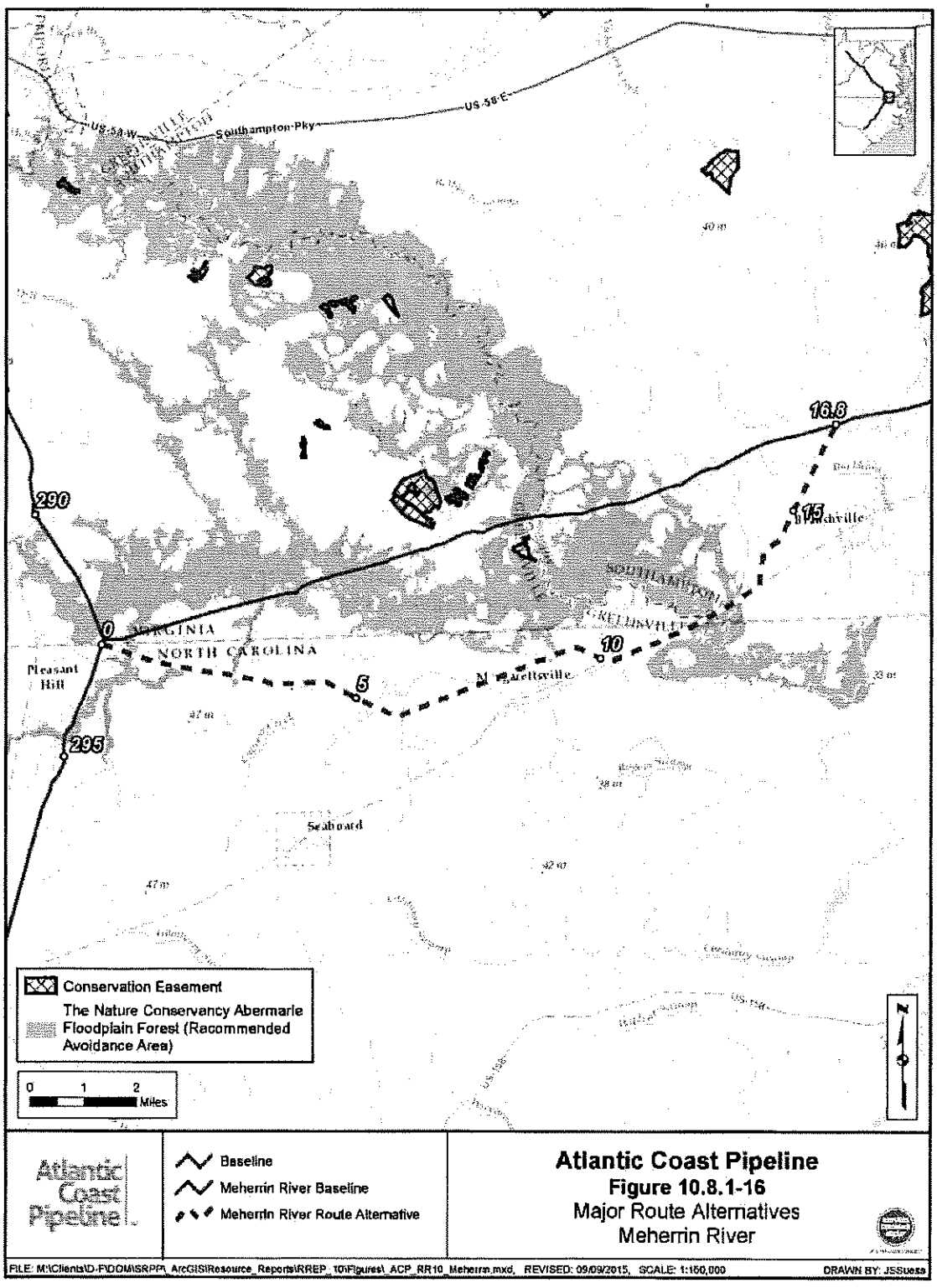
Meherrin River Major Route Alternative for the Atlantic Coast Pipeline

Features	Unit	Baseline Route	Meherrin River Route Alternative
Length	Miles	14.7	16.8
Primary U.S. or State/Commonwealth highway crossed	Number	1	2
Other State/Commonwealth or local roads crossed	Number	20	19
Adjacent to existing linear corridor facilities	Miles	0.0	6.8
Federal lands crossed	Miles	0.0	0.0
State/Commonwealth lands crossed	Miles	0.0	<0.1
Private lands crossed	Miles	14.7	16.8
Conservation easements crossed	Miles	0.0	<0.1
Forested lands crossed	Miles	3.6	3.5
Wetlands crossed – freshwater emergent	Miles	0.0	0.3
Wetlands crossed – freshwater forested/shrub	Miles	6.5	6.2
Wetlands crossed – other	Miles	0.0	0.1
Intermittent waterbodies crossed	Number	9	7
Perennial waterbodies crossed	Number	13	14
TNC floodplain forest recommended for avoidance	Miles	4.1	1.4

The baseline route for the AP-3 lateral trends southwest to northeast across Greensville and Southampton Counties, Virginia, crossing Fountains Creek approximately 4.7 miles from the AP-1 mainline and the Meherrin River just north of Haley's Bridge approximately 8.4 miles from the AP-1 mainline. Starting at Compressor Station 3, the Meherrin River Route Alternative initially extends to the east-southeast for approximately 5.8 miles across Southampton County, North Carolina, passing south of the Fountains Creek watershed. It then heads to the northeast for approximately 7.6 miles, mostly adjacent to existing power lines, roads, or railroads. It crosses the Meherrin River along the Virginia Commonwealth/North Carolina State line adjacent to an existing railroad. The alternative route then heads north-northeast for approximately 3.4 miles, where it intersects the baseline route in Southampton County, Virginia.

The Meherrin River Route Alternative is 2.1 miles longer than the baseline, but avoids Fountains Creek and crosses 2.7 miles less of floodplain forest areas recommended for avoidance by TNC. About 70 percent (1.0 mile) of the floodplain forest along the alternative route occurs at the Meherrin River crossing, which is adjacent to an existing railroad. This will minimize impacts in the watershed due to forest fragmentation. The alternative route additionally is adjacent to existing linear corridor facilities (power lines and roads) for approximately 6.8 miles (40 percent) compared to 0.0 miles for the baseline. Crossings of forested lands, wetlands, and waterbodies are similar for both routes.

Based on the feasibility of collocation with other utility corridors in this area, and the relative similarity of the impact on other major resource considerations, Atlantic incorporated the Meherrin River Route Alternative into the proposed route.


US-58-W
Southampton Pky
US-58-E
16.8
290
0
VIRGINIA
NORTH CAROLINA
Pleasant Hill
5
10
15
295
Seaboard
Conservation Easement
The Nature Conservancy Abermarle Floodplain Forest (Recommended Avoidance Area)
0 1 2 Miles
Atlantic Coast Pipeline
Baseline
Meherrin River Baseline
Meherrin River Route Alternative
Atlantic Coast Pipeline
Figure 10.8.1-16
Major Route Alternatives
Meherrin River
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3.9.2.5 Franklin Major Route Alternative

Based on information provided by FERC staff, Atlantic identified a major route alternative (Franklin 1) along the AP-3 lateral adjacent to an existing DVP 115 kilovolt electric transmission line in Southampton and Isle of Wight Counties and Cities of Franklin and Suffolk, Virginia. Atlantic subsequently modified and optimized this route into Franklin 2 to avoid crossing industrial waste ponds located south of the town of Franklin. The baseline route, Franklin 1, and Franklin 2 are depicted on Figure 10.8.1-19, and comparative information on each route is provided in Table 10.8.1-17.

The baseline route extends to the east for about 18.4 miles approximately between MP 33.8 in Southampton County and MP 53.7 in the City of Suffolk. The Franklin 1 route is north of and generally parallel to the baseline, passing south of developed areas in the City of Franklin, crossing U.S. Highway 58 near the intersection with O'Kelly Drive. Starting at MP 33.8, Franklin 1 initially heads northeast along a greenfield for about 1.7 miles. It then follows the existing electric transmission line to the east for approximately 15.8 miles. Franklin 1 lastly heads south for about 0.5 mile along a greenfield to its terminus approximately at MP 53.7.

Franklin 2 follows the baseline route until it reaches MP 40.5, where it heads north along a greenfield corridor for 2.3 miles, then follows the existing electric transmission line for 2.4 miles, avoiding the Suffolk Cotton Gin facility at O'Kelly Road. The route then continues to the east along the existing electric transmission line for approximately 4.8 miles before connecting with the AP-3 lateral at MP 53.7.

TABLE 10.8.1-17

Franklin Major Route Alternatives for the Atlantic Coast Pipeline

Features	Unit	Baseline Route	Franklin Route Alternative 1	Franklin Route Alternative 2
Length	Miles	18.4	18.3	19.9
Primary U.S. or State/Commonwealth highway crossed	Number	2	9	6
Other State/Commonwealth or local roads crossed	Number	22	24	22
Adjacent to existing linear corridor facilities	Miles	0.0	16.5	6.8
Federal lands crossed	Miles	0.0	0.0	0.0
State/Commonwealth lands crossed	Miles	0.0	0.0	0.0
Private lands crossed	Miles	18.2	18.1	19.9
Conservation easements crossed	Miles	0.0	0.6	0.4
Forested lands crossed	Miles	11.0	8.7	10.9
Total wetlands crossed	Miles	2.8	1.9	2.8
Wetlands crossed – freshwater emergent	Miles	0.0	1.3	0.1
Wetlands crossed – freshwater forested/shrub	Miles	2.8	0.2	2.7
Wetlands crossed – other	Miles	0.0	0.4	0.0
Intermittent waterbodies crossed	Number	10	19	10
Perennial waterbodies crossed	Number	29	23	28

The baseline route measures approximately 18.4 miles in length, none of which is adjacent to existing linear corridor facilities. It crosses 39 waterbodies, of which 29 are

perennial; about 2.8 miles of wetlands; and about 11.0 miles of forested land. The baseline route avoids crossings of public lands and conservation easements.

At 18.3 miles in length, Franklin 1 is the shortest of the three routes. Approximately 16.5 miles (90 percent) is adjacent to the existing electric transmission line, which is greater than the baseline and Franklin 2. The route crosses the fewest perennial waterbodies, the fewest miles of wetlands, including forested wetlands, and the fewest miles of forested land. Franklin 1 crosses industrial waste ponds located on the south side of Franklin, while the baseline and Franklin 2 routes avoid these features. The waste ponds would be a significant constraint to cross, with potential to impact contaminated soils. Franklin 1 avoids public lands, though it crosses approximately 0.6 mile of conservation easement held by the VOF (see Figure 10.8.1-19).

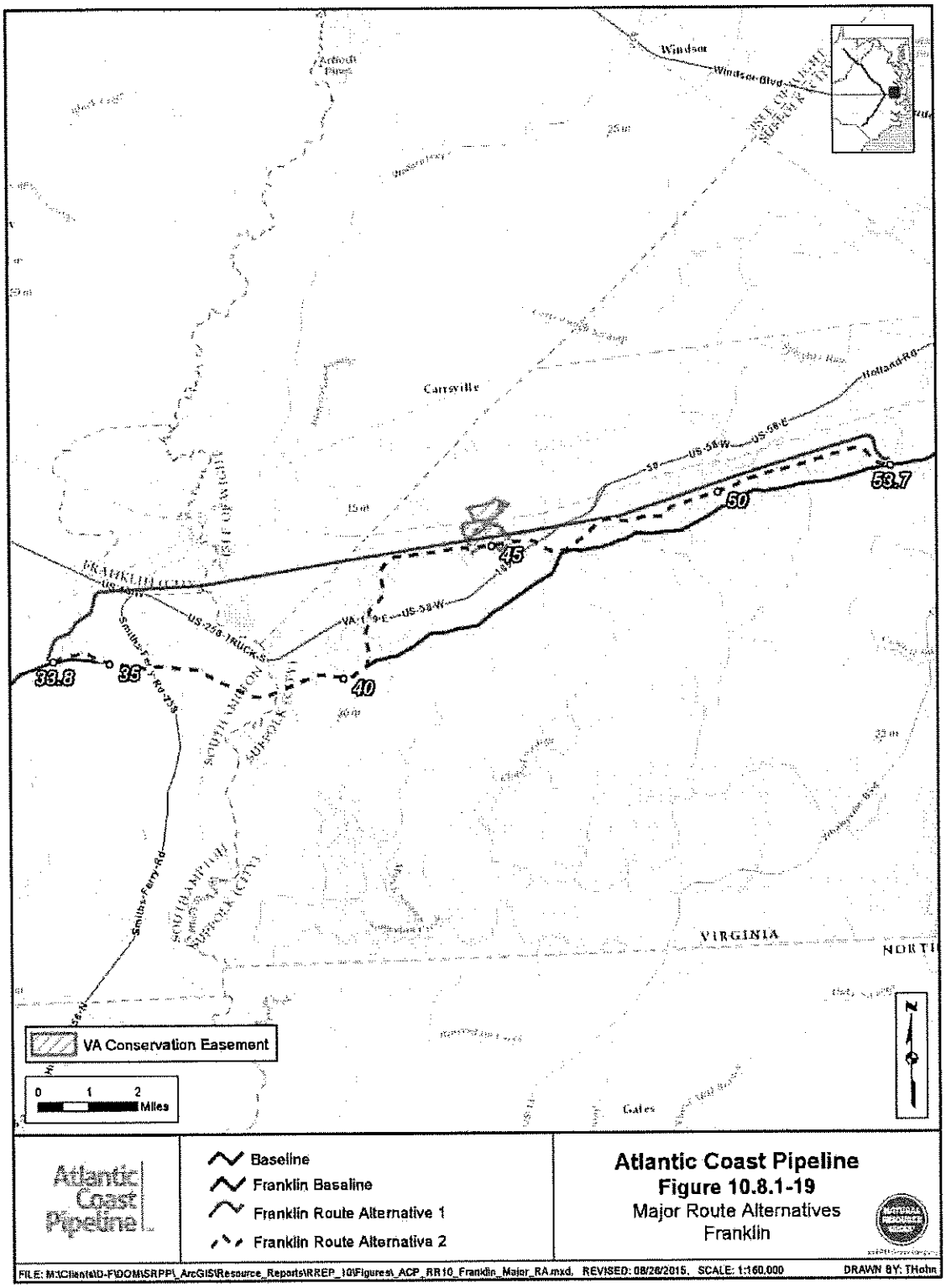
Franklin 2 measures approximately 19.9 miles in length, which is the longest of the three routes. Approximately 6.8 miles (34 percent) is adjacent to the existing electric transmission line, which is more than the baseline but less than Franklin 1. Crossings of wetlands and waterbodies are similar to the baseline but greater than Franklin 1. The route crosses less forested land than the baseline but more than Franklin 1. Like the baseline, Franklin 2 avoids the industrial waste ponds crossed by Franklin 1. It avoids crossing public lands, but crosses approximately 0.4 mile of conservation easements held by the VOF.

Although Franklin 1 is mostly adjacent to the existing electric transmission line and crosses the fewest perennial waterbodies and least amount of wetlands and forested land, the crossing of the industrial waste ponds is a significant constraint. The Franklin 2 route minimizes impacts on waterbodies, wetlands, and forested lands relative the baseline, and additionally avoids the waste ponds. Moreover, some of the impacts on forested lands would be minimized due to collocation of Franklin 2 with the existing electric transmission line. For these reasons, Atlantic incorporated Franklin 2 into the proposed route.

3.9.3 Route Variations and Route Adjustments for the Norfolk District

As noted above, alternative alignments are being evaluated under the FERC EIS process. Those alternative alignments will affect the location and configuration of each single and complete project so background information on the FERC NEPA process is provided below.

Atlantic's analysis of route variations and adjustments used a geographic information system (GIS) to characterize crossings of environmental features and other constraints along the routes. A digital centerline for each route alternative and the corresponding segment of the baseline was compared with a variety of datasets and map resources in the GIS. Features and constraints considered in the analysis included: length, public lands crossed, roads crossed, conservation easements crossed, forested lands crossed (based on the National Land Cover Database), wetlands crossed (based on the National Wetlands Inventory), waterbodies crossed (based on the National Hydrography Dataset), and known cultural resources sites crossed, such as Civil War battlefields.


Windsor
Windsor Blvd
Carrsville
Holland Rd
US-58-W
US-58-E
33.8
35
40
45
50
53.7
US-258-TRUCK-S
VA-189-E
Smiths Ferry Rd
VIRGINIA
Gates
VA Conservation Easement
0 1 2 Miles
Baseline
Franklin Basaline
Franklin Route Alternative 1
Franklin Route Alternative 2
Atlantic Coast Pipeline
Figure 10.8.1-19
Major Route Alternatives
Franklin
FILE: M:\Clients\D-FDOM\SRPP_ArcGIS\Resource_Reports\RREP_10\Figures_ACP_RR10_Franklin_Major_RA.mxd, REVISED: 08/26/2015, SCALE: 1:160,000
DRAWN BY: THohn

Once a baseline route was determined using desktop data, a field oriented routing team consisting of a lead construction router, civil survey staff, and an ecological specialist teamed to adjust the route based on site-specific conditions while weighing competing constraints associated with environmental, tribal, and historical resource protection, constructability, available technology, and logistical constraints. Where practicable, adjustments to the route were made to avoid and/or minimize impacts to wetlands and waterbodies.

As a result of desktop analyses and field surveys, Atlantic identified a number of route variations and adjustments along the proposed pipeline routes to avoid or minimize crossings of sensitive environmental features or to address engineering or other issues. Additional route alternatives or variations may be considered to address issues identified as a result of ongoing environmental and civil field surveys, engineering design work, agency consultations, landowner communications, or other stakeholder input.

Atlantic has evaluated numerous route variations (1 to 5 miles in length) and minor route adjustments to optimize the baseline route as a result of ongoing routing, biological, cultural resources, and civil field surveys. The primary criterion for comparing route variations to the baseline route was cumulative impact avoidance relative to the objective of the route variation. The route adjustments were adopted without a formal alternatives analysis, but the need for the adjustment was intuitive and practical (e.g., a slight shift in the centerline to avoid a wetland). Individually, the adjustments to the routes are small, but collectively they reduce impacts on environmental resources. Table 3.9.4-1 lists the route alternatives, route variations, and minor route adjustments to date that have been incorporated into the proposed ACP pipeline route within the Commonwealth of Virginia and a brief rationale for each adjustment.

3.9.3.1 Chesapeake Wetland Mitigation Potential Route Variation

Subsequent to analyzing the GDS route alternatives, Atlantic identified and evaluated a potential route variation to reduce impacts to the Chesapeake Wetland Mitigation Bank south of the Sunray Historic District in the City of Chesapeake. Starting at MP 70.1 of the proposed AP-3 lateral (i.e., along GDS 5), the potential route variation heads to the southeast for about 1.0 mile, until it is just north of the existing Norfolk and Western Railroad. The route variation then heads east and parallels the railroad tracks for approximately 1.3 miles. After crossing the railroad tracks, the variation rejoins the proposed route (GDS 5) approximately at MP 72.4.

Both the route variation and the corresponding segment of the proposed route (GDS 5) are 2.3 miles long and both are located entirely within wetlands. The route variation would be located on 2.3 miles of lands owned by the Chesapeake Wetland Mitigation Bank and less than 0.1 mile of GDS-NWR lands. The GDS 5 route crosses 1.8 miles of the mitigation bank, and 0.5 mile of private lands. However, the potential route variation would be collocated with the existing railroad for approximately 1.3 miles, which is about 0.9 more mile than the corresponding segment of the proposed route. For these reasons, Atlantic incorporated the route variation into the proposed route.

TABLE 3.9.4-1

Route Adjustments Incorporated into the Proposed Atlantic Coast Pipeline Project Route within the Commonwealth of Virginia

Route Adjustment	Approximate Mileposts	State	Rationale
ATLANTIC COAST PIPELINE			
AP-1 Mainline			
GWNF 6 Route Adjustments - Michael Mountain/Sugar Camp Trail	79.6 to 84.7	WV/VA	Various adjustments to improve constructability and reduce side-slope crossings in mountainous terrain
GWNF 6 Route Adjustment - Steep Pinch Ridge	84.7 to 85.8	VA	Adjustment to improve constructability
GWNF 6 Route Adjustment - Back Creek	87.0 to 88.4	VA	Adjustment to avoid a wetland and increase distance from a historic school and home
GWNF 6 Route Adjustment - Pine Mountain	88.5 to 89.4	VA	Adjustment to avoid an existing campground
GWNF 6 Route Adjustment - Peak Run	89.6 to 90.5	VA	Adjustment to improve constructability and reduce side-slope crossings in mountainous terrain, square the route to steep slopes, and avoid impacts on a tower site
GWNF 6 Route Adjustment – Singleton	91.9 to 92.7	VA	Adjustment to avoid a conservation easement
GWNF 6 Route Adjustments - Gibson Hollow/Deerfield Road	99.2 to 101.8	VA	Various adjustments to improve constructability and reduce side-slope crossings in mountainous terrain
GWNF 6 Route Adjustment - Hunt Heart Fort Lane	110.0 to 111.0	VA	Adjustment to avoid crossing water pipelines
GWNF 6 Route Adjustment - Bear Wallow Flat	111.6 to 112.2	VA	Route adjustment to address landowner request to avoid house site and address other issues
GWNF 6 Route Adjustment - Hodges Draft	112.5 to 113.4	VA	Adjustment to increase distance from a residence and address a landowner request
GWNF 6 Route Adjustment - Route 716	113.5 to 114.5	VA	Adjustment
Braley Pond Road	116.3 to 117.0	VA	Adjustment to optimize crossing of Calfpasture River
Hangars Mill Road	128.1 to 128.8	VA	Adjustment to avoid a karst feature
Cochrans Mill Road	139.2 to 140.2	VA	Adjustment to avoid a cultural resource site and a cave
White Hill Road	140.8 to 141.6	VA	Adjustment to avoid a waterbody crossing
Churchmans Mill Road	141.5 to 142.6	VA	Adjustment to follow property boundaries
Christians Creek	141.6 to 142.6	VA	Adjustment to avoid a wetland
Wayne Avenue	145.2 to 146.6	VA	Adjustment to follow property boundaries
Cisco Lane	147.1 to 148.2	VA	Adjustment to follow property boundaries
Schages Lane	149.3 to 149.9	VA	Adjustment to increase collocation with road
China Clay Road	149.9 to 152.0	VA	Adjustment to optimize pipeline route
Mount Torrey Road	155.4 to 156.0	VA	Adjustment to avoid a residence
Sherando Lake Road	156.5 to 157.6	VA	Adjustment to increase distance from residences
Wintergreen Drive	158.7 to 159.2	VA	Adjustment to avoid road crossing
Beech Grove Road	158.9 to 159.1	VA	Adjustment to improve slope crossing
Bryant Mountain Road	160.0 to 160.7	VA	Adjustment to increase distance from residences and avoid road crossings
Winery Lane	160.9 to 161.4	VA	Adjustment to increase distance from residences
Horizons Village II	162.0 to 162.8	VA	Adjustment to avoid a seep at the Spruce Creek Conservation Site
Glenthorne Loop Road	163.1 to163.7	VA	Adjustment to minimize crossing of Bold Rock Cidery
Gullysville Lane	164.7 to 166.1	VA	Adjustment to reduce side-slope crossings
Stagebridge Road	170.0 to 171.6	VA	Adjustment to avoid a proposed building and address a landowner request
Starvale Lane	171.2 to 172.2	VA	Adjustment to reduce tree clearing
Laurel Road	174.2 to 176.9	VA	Adjustment to reduce side-slope crossings
Cabell Road	183.2 to 184.2	VA	Adjustment to avoid future home sites
Woodland Church Road	185.0 to 186.4	VA	Adjustment to reduce side-slope crossing

TABLE 3.9.4-1

Route Adjustments Incorporated into the Proposed Atlantic Coast Pipeline Project Route within the Commonwealth of Virginia

Route Adjustment	Approximate Mileposts	State	Rationale
Warminister Church Road	188.0 to 189.9	VA	Adjustment to reduce tree clearing as requested by a landowner and also to avoid a cultural resource site
Sycamore Creek Road	189.7 to 190.4	VA	Adjustment to meet a landowner request to avoid a family recreation site
Shelton Store Road	190.6 to 190.9	VA	Adjustment to meet a landowner request
Compressor Station 2	191.2 to 192.2	VA	Adjustment to connect to Compressor Station 2
Compressor Station 2	191.3 to 192.1	VA	Adjustment to optimize approach and exit from Compressor Station 2
Licky Branch	198.2 to 199.1	VA	Adjustment to avoid a waterbody crossing
Horsepen WMA	199.0 to 200.0	VA	Adjustment to avoid Horsepen WMA
Dixie Hill Road	200.5 to 201.7	VA	Adjustment to avoid a cultural resource site
Dixie Hill Road	201.3 to 201.6	VA	Adjustment to avoid haul roads and stabilized areas at the request of the landowner
Bucking B Ranch Lane	203.1 to 203.2	VA	Adjustment to avoid a haul road and stabilized areas at the request of the landowner
Rock Mill Road	203.5 to 204.6	VA	Adjustment to reduce the number of landowners crossed
Rock Mill Road II	203.5 to 204.6	VA	Adjustment to address a landowner request
Old Curdsville Road	208.1 to 209.0	VA	Adjustment to address a landowner request
Old Curdsville Road	208.6 to 208.9	VA	Adjustment to meet landowner request and follow the field edge
Little Willis River 1	209.0 to 209.4	VA	Adjustment to avoid two waterbody crossings
Little Willis River 2	209.8 to 210.0	VA	Adjustment to avoid two waterbody crossings
High View Road	209.5 to 210.3	VA	Adjustment to reduce wetland impacts
Raines Tavern Road	212.9 to 213.8	VA	Adjustment to avoid two waterbody crossings
River Road	219.9 to 220.4	VA	Adjustment to avoid a wetland
High Bridge Road	220.6 to 221.5	VA	Adjustment to reduce the number of landowners crossed
South Genito Road	226.5 to 227.0	VA	Adjustment to avoid a wetland
Dutchtown Road	228.3 to 228.5	VA	Adjustment to avoid a cemetery
Little Creek	230.3 to 231.1	VA	Adjustment to avoid a waterbody crossing
Deep Creek	235.9 to 237.0	VA	Adjustment to minimize a wetland crossing
Winningham Road	237.2 to 237.6	VA	Adjustment to improve a road crossing and reduce clearing of mature trees
Woody Creek	238.7 to 240.6	VA	Adjustment to minimize a wetland crossing
Watson Creek Road	241.3 to 241.8	VA	Adjustment to avoid multiple crossings of a waterbody
Cellar Creek Road	241.5 to 243.1	VA	Adjustment to avoid existing buried utilities
Cottage Road	243.1 to 244.9	VA	Adjustment to avoid a planned stream mitigation bank
Green Gable Road	245.8 to 246.4	VA	Adjustment to straighten and optimize the pipeline route
Colonial Trail Highway	246.6 to 247.4	VA	Adjustment to increase distance from residences
White Oak Road	253.9 to 254.5	VA	Adjustment to reduce the pipeline length
White Oak Road	254.0 to 254.6	VA	Adjustment to meet landowner request to move pipeline out of field and avoid an existing pond
Gills Bridge Road	259.7 to 261.5	VA	Adjustment to avoid a gem mine and house as requested by a landowner and to reduce crossings of cultural resource sites
Rawlings Road	264.0 to 264.7	VA	Adjustment to reduce tree clearing
Brunswick Powerline	267.1 to 279.5	VA	Various adjustments to improve collocation with the existing DVP electric transmission line
Columbia Gas Transmission	288.6 to 289.8	VA	Adjustment to increase collocation with existing natural gas transmission pipeline
Skippers Road	293.5 to 294.8	VA	Adjustment to avoid a planned rock quarry
Taylors Mill Road	296.7 to 297.5	VA	Adjustment to minimize a wetland crossing
AP-3 Lateral			
Hugo Road	13.3 to 13.5	VA	Adjustment to optimize a railroad crossing

TABLE 3.9.4-1

Route Adjustments Incorporated into the Proposed Atlantic Coast Pipeline Project Route within the Commonwealth of Virginia

Route Adjustment	Approximate Mileposts	State	Rationale
DVP Electric Transmission Line	14.6 to 22.3	VA	Adjustment to improve collocation with the existing DVP electric transmission line
Cross Keys Road	20.5 to 21.5	VA	Adjustment to increase collocation with existing utility corridor
Newsome	22.5 to 23.0	VA	Adjustment to optimize route based upon field survey data
Grays Shop Road	23.7 to 24.1	VA	Adjustment to avoid a wetland
Thomaston Road	25.7 to 26.7	VA	Adjustment to reduce tree clearing and increase collocation with an existing linear utility corridor
Cypress Bridge Road	26.9 to 27.4	VA	Adjustment to follow a field edge per landowner request
Bishop Poquoson Road	28.6 to 28.9	VA	Adjustment to avoid a wetland
Sycamore Church Road	33.9 to 34.9	VA	Adjustment to follow property boundary
Highway 58	41.1 to 41.5	VA	Adjustment to address a landowner request
Elwood Road	42.8 to 45.9	VA	Adjustment to reduce tree clearing, increase collocation with an existing linear utility corridor, and reduce wetland impacts
Franklin	44.4 to 45.5	VA	Adjustment to avoid a conservation easement
OKelly drive	46.5 to 46.7	VA	Adjustment to optimize route based upon field survey data
Longstreet Lane	47.6 to 48.8	VA	Adjustment to improve collocation with an existing electric transmission line
Pioneer Road	49.3 to 50.4	VA	Adjustment to reduce the pipeline length and optimize a railroad crossing
Holland Road	50.8 to 51.6	VA	Adjustment to meet a landowner request
Deer Path Road	52.8 to 53.9	VA	Adjustment to avoid a planned rail yard and wildlife area at the request of the landowner
Deer Path Road	53.5 to 54.3	VA	Adjustment to avoid proposed future wildlife refuge
Kings Fork Road	55.6 to 55.9	VA	Adjustment to reduce tree clearing
Lake Point Road	59.0 to 60.2	VA	Adjustment to avoid a proposed future development
Lake Prince	60.6 to 61.4	VA	Adjustment to improve HDD crossing location
Godwin Boulevard	63.1 to 63.5	VA	Adjustment to improve a road crossing
Nansemond River	64.2 to 65.1	VA	Adjustment to improved crossing angle of Nansemond River
Nansemond Parkway	66.4 to 69.0	VA	Adjustment to reduce tree clearing and increase collocation with an existing linear utility corridor
West Military Highway	71.3 to 71.8	VA	Adjustment to optimize crossing of West Military Highway and avoid Federal land crossing
Truitt Road	73.0 to 73.6	VA	Adjustment to optimize route based upon field survey data
Norfolk Western Railroad	76.0 to 76.1	VA	Adjustment to optimize a railroad crossing
Galberry Road	77.5 to 77.9	VA	Adjustment to improve collocation with an existing electric transmission line
West Military Highway	68.0 to 68.4	VA	Adjustment to optimize crossing of West Military Highway and auto salvage yard
Hampton Roads Beltway	77.6 to 79.5	VA	Adjustment to optimize collocation with an existing linear utility corridor
Forest Cove Drive	79.7 to 80.3	VA	Adjustment to optimize collocation near existing electric transmission substation
South Military Highway	81.2 to 82.1	VA	Adjustment to optimize pipeline location near existing industrial facility and optimize crossing of South Branch Elizabeth River
AP-4 Lateral			
Governor Harrison Parkway	0.0 to 0.3	VA	Adjustment to improve connection to proposed electric generation facility
AP-5 Lateral			
Rogers Road	0.5 to 1.0	VA	Adjustment to improve connection to proposed electric generation facility

3.9.3.2 Spruce Creek Variation

Atlantic identified and evaluated a route variation between MPs 160.9 and 163.9 of the AP-1 mainline in Nelson County, Virginia in an effort to maximize the use of pasture and agricultural land in the Rockfish Valley; minimize ridgetop and forest impacts; and avoid or minimize impacts on cultural and historic properties, nature trails, waterbodies, the Spruce Creek Tributary Conservation Site, and planned developments. The Spruce Creek Route Variation and the corresponding segment of the proposed route are depicted on Figure 156-1; comparative data on each route are provided in Table 10.7-2.

Starting at approximately MP 160.9, the corresponding segment of the proposed route initially heads east for approximately 2.2 miles, running along an east-trending ridgeline on Bryant Mountain and entering the Rockfish Valley east of Spruce Creek. After crossing Rockfish Valley Highway, the route heads southeast for approximately 0.8 mile, crossing the South Fork Rockfish River approximately 0.4 mile east of Elk Hill Church, and terminating at approximately MP 163.9.

Relative to the proposed route, the Spruce Creek Route Variation initially heads south off the east trending ridgeline on Bryant Mountain for approximately 0.8 mile entering into Rockfish Valley. At a point about 0.4 mile north of Beech Grove Road, the route variation turns to the southeast and continues for approximately 0.4 mile, crossing the South Fork Rockfish River west of Winery Lane. The route variation then continues east across the valley for approximately 2.4 miles, crossing Rockfish Valley Highway and Edgewood Drive, and then reconnects to the proposed route at approximately MP 163.9.

The proposed route is 0.6 mile shorter and crosses one less primary highway than the route variation. The proposed route crosses seven more parcels than the route variation, though neither route passes within 125 feet or 50 feet of a residence. The proposed route is nearest to residences where it crosses Rockfish Valley Highway, while the route variation is nearest to residences where it passes near Beech Grove and again where it crosses Rockfish Valley Highway. Neither route is adjacent to existing linear corridor facilities.

TABLE 10.7-2

Spruce Creek Route Variation

Features	Unit	Proposed Route	Spruce Creek Route Variation
Length (total)	Miles	3.0	3.6
Adjacent to existing linear corridor facilities (total)	Miles	0.0	0.0
Primary U.S. or State/Commonwealth highways crossed	Number	1	2
Other State/Commonwealth or local roads crossed	Number	3	3
Property owners affected	Number	22	15
Residences within 125 feet of the pipeline centerline	Number	0	0
Residences within 50 feet of the pipeline centerline	Number	0	0
Wetlands crossed – forested	Miles	0.0	0.0
Wetlands crossed – shrub	Miles	0.0	0.0
Wetlands crossed – emergent	Miles	0.0	0.0
Intermittent waterbodies crossed	Number	1	2
Perennial waterbodies crossed	Number	3	2
Land use types crossed – forested	Miles	2.4	0.7

TABLE 10.7-2

Spruce Creek Route Variation

Features	Unit	Proposed Route	Spruce Creek Route Variation
Land use types crossed – agricultural	Miles	<0.1	0.0
Previously recorded archaeological sites crossed	Number	0	0
Previously recorded historic architectural sites crossed	Number	1	4
Battlefields crossed	Miles	0.0	0.0
Federal lands crossed	Miles	0.0	0.0
Commonwealth lands crossed	Miles	0.0	0.0
Recreational trails crossed	Number	1	1
U.S. Geological Survey karst topography crossed	Miles	0.0	0.0
U.S. Geological Survey Soil Survey (SSURGO) soils crossed			
Hard shallow bedrock [a]	Miles	0.5	0.3
Soft shallow bedrock [b]	Miles	0.5	0.3
Highly erodible by water [c]	Miles	2.0	0.9
Highly erodible by wind [d]	Miles	0.0	0.0
Revegetation concerns [e]	Miles	2.0	0.9
Length of steep slope crossed (greater than 30 percent)	Miles	0.6	0.3
Length of side slope crossed (greater than 30 percent)	Miles	0.0	0.0
Moderate to high landslide incidence/susceptibility areas crossed	Miles	3.0	3.6
Conservation easements crossed	Miles	0.0	0.8
VDCR conservation sites crossed			
Spruce Creek Conservation Site	Feet	200	0
Planned developments crossed			
Spruce Creek Resort and Market	Miles	0.3	0.0

[a] Includes soils that have bedrock within 60 inches of the soil surface. Hard bedrock refers to lithic bedrock that may require blasting or other special construction techniques during installation of the proposed pipeline segments.

[b] Includes soils that have bedrock within 60 inches of the soil surface. Soft bedrock refers to paralithic bedrock that will not likely require blasting during construction.

[c] Includes land in capability subclasses 4E through 8E and soils with an average slope greater than or equal to 9 percent.

[d] Includes soils with Wind Erodibility Group classification of one or two.

[e] Includes coarse-textured soils (sandy loams and coarser) that are moderately well to excessively drained and soils with an average slope greater than or equal to 9 percent.

The proposed route crosses one more perennial waterbody and one less intermittent waterbody than the route variation. Neither route crosses or affects wetland resources. The route variation crosses 1.7 miles less forested land than the proposed route, mainly due to its longer crossing of Rockfish Valley, which is mostly agricultural. The route variation crosses approximately 0.8 mile of conservation easement held by the VOF on the south side of the South Fork Rockfish River; the proposed route passes approximately 0.2 mile to the north of the easement. While neither route crosses battlefields or previously recorded archaeological sites, the proposed route crosses three fewer historic architectural sites than the route variation. Both routes cross one recreational trail.

Based on review of the USGS's Soil Survey Geographic Database, the proposed route crosses 0.2 more mile of soils with near surface hard bedrock, 0.2 more mile of soils with near surface soft bedrock, 1.1 more miles of soils which are highly erodible by water, and 1.1 more miles of soils with revegetation concerns. The proposed route crosses 0.3 more miles of slopes greater than 30 percent, but the route variation crosses 0.6 more miles of lands classified by the

USGS as having moderate to high potential for landslides. Neither route crosses areas characterized as karst by the USGS.

The proposed route crosses < 0.1 mile (approximately 200 feet) of the Spruce Creek Conservation Site, which consists of a Central Appalachian Low-Elevation Acidic Seepage, as identified by the VDCR. In a letter to FERC dated October 9, 2015, the VDCR recommended avoidance of this site. The Spruce Creek Route Variation avoids the conservation site.

The proposed Spruce Creek Resort and Market, a planned development, is located between Spruce Creek Lane, Horizons Village Road, and Highway 151 in Nelson County. Under the current development proposal, the proposed route crosses approximately 0.3 mile of the planned development, but would minimize impacts on the development by crossing near proposed cabin sites rather than crossing near the proposed market. For this reason, Atlantic believes that the AP-1 mainline is compatible with the resort. The Spruce Creek Route Variation avoids the planned development.

While there are advantages and disadvantages to each route, Atlantic believes that on balance the proposed route minimizes impacts on sensitive resources and other constraints. The route variation reduces crossings of forested lands and avoids the Spruce Creek Conservation Site and Spruce Creek Resort and Market, but crosses a VOF conservation easement and more miles of land classified by the USGS as having a moderate to high potential for landslides. It is unlikely that the route variation could be adjusted to avoid the conservation easement and still address the other resource concerns identified by FERC, such as crossings of forested land. Potential alternative routes to the north of the conservation easement could affect the South Fork Flats Conservation Site (a Piedmont Upland Depression Swamp identified as a sensitive resource by the VDCR) and/or forested lands at the base of Bryant Mountain. Potential alternative routes to the south would cross forested lands south of Beech Grove Road.

For all these reasons, Atlantic believes that the Spruce Creek Route Variation provides no substantive environmental advantages over the proposed route. Additionally, as discussed below, Atlantic identified and evaluated two route adjustments, the Horizons Village 1 and Horizons Village 2 Route Adjustments, which avoids the Spruce Creek Conservation Site.

3.9.3.3 Singleton Route Adjustment

In its response to Question 154 of FERC's Data Request dated December 5, 2015, which was provided to FERC on February 16, 2016 (FERC Accession Number 20160216-5311), Atlantic adopted an alternative route for the AP-1 mainline (i.e., GWNF 6) in Randolph and Pocahontas Counties, West Virginia and Highland, Bath, and Augusta Counties, Virginia. Atlantic subsequently identified and evaluated an approximately 1.2-mile-long route adjustment along the GWNF 6 route between approximately MPs 91.9 and 92.7 in Bath County, Virginia to avoid an open-space conservation easement held by the VOF. The route adjustment is generally parallel to and within 0.3 mile of the corresponding segment of the proposed route. The route adjustment is the same length as the proposed route, and environmental conditions along the two routes are similar. For these reasons, Atlantic has incorporated the route adjustment into the proposed route.

3.9.4 Route Optimization to Protect Wetlands and Waterbodies

Route optimization efforts that have occurred to minimize impacts on wetlands and waterbodies within Virginia are listed in Table 3.9.4-1.

TABLE 3.9.4-1

Route Optimization Locations to Avoid Wetlands within the Commonwealth of Virginia

Route Segment/ Approximate Mileposts	Wetland ID	Wetland Avoided	Rationale
AP-1			
91.0		No	Nearby archeological site
153.0		No	Shift would move too close to structure
178.9	wnea050s	Yes	
208.2	wbuk013f	Yes	
208.4	wbuk016f	Yes	
210.7	wbuu202f	Yes	
219.2	wcuk007e	Yes	
225.9	wnok001f	Yes	
250.8	wdim013f	Yes	
250.9	wdim014f	Yes	
AP-3			
13.3	wsop003f/wsop003e	Yes	
22.9	wsoa032f	Yes	
23.8	wsoa006s	Yes	
28.7	wsol015f/wsol015e	Yes	
28.8	wsoa033f/wsoa033e	Yes	
40.0		No	Centerline would fall too close to residences

As part of the ongoing permitting efforts, ACP met with USACE staff in the field to make minor route adjustments to avoid and minimize wetland impacts and to address USACE concerns on a number of occasions. Details of these field visits are presented in Table 1-2.

Appendix A includes detailed route maps that illustrate how Atlantic has also minimized impacts to wetlands and waterbodies by reducing workspace at wetland crossings and in the vicinity of wetlands and waterbodies, where feasible. In addition, to avoid impacts to wetlands along the periphery of the construction workspace, modifications to workspace have been incorporated into the project design to minimize impacts to wetlands and waterbodies. Atlantic was able to avoid impacts to wetlands and waterbodies along proposed access roads at several locations throughout the Norfolk District. Table B-5 in Appendix B provides a list of additional Waters of the U.S. where permanent impacts were avoided along access roads and by the use of HDD within the Norfolk District due to changes in access road routing, design, and configuration.

Despite Atlantics efforts to avoid and minimize impacts, there will be impacts that cannot be avoided. These impacts will be offset with compensatory mitigation, discussed in Section 9.4 of this of this Joint Permit Application document.

3.9.5 Aboveground Facilities Avoidance and Minimization

Atlantic identified potential properties for aboveground facilities and conducted surveys to identify potential impacts to Waters of the U.S. Based on the findings of these surveys, Atlantic then designed the footprint for the aboveground facilities in such a way as to avoid and minimize permanent impacts on wetlands and waterbodies to the fullest extent possible. After locating facilities to avoid impacts on wetlands and waterbodies to the maximum extent practicable, Atlantic identified one facility site, the South Branch Elizabeth River M&R facility, which would require loss of wetlands to accommodate the facility. After initial site planning, the design was modified to further reduce impacts along the southeastern and eastern periphery of the site. This minimization is illustrated in a site drawing and map provided in Appendix A, Figure A-6.

4.0 PROJECT COSTS

Atlantic has estimated the approximate cost of the project in Virginia, including materials and labor, to be $236.5 million annually and $1.4 billion cumulatively for activities up through construction. Annual operations and maintenance costs are expected to be approximately $37.8 million. Costs for construction activities that will have an effect, either temporary or permanent, on State water as defined in the JPA are expected to exceed the $500,000 threshold set by the VMRC; this is the threshold above which the VMRC may not approve alone but recommends for approval.

5.0 PUBLIC NOTIFICATION

A detailed list of affected landowners is provided in Appendix J. Atlantic has contacted affected landowners in regards to site acquisition for the ACP and has been in contact with many of the adjacent landowners to the project area. Atlantic has made staff available via communication lines listed on the project webpage (www.dom.com/acpipeline) for interested parties, including adjacent and affected land owners. Table 5-1 contains a list of newspapers having general circulation in the project area and information to contact those publications.

TABLE 5.0-1

Newspapers in the Vicinity of the Project Area within the Commonwealth of Virginia

Newspaper	Mailing Address	City	State	Zip Code	Phone Number
The Recorder	P.O. Box 10	Monterey	VA	24465	540-468-2147
Staunton Daily News Leader	1300 W Main St	Staunton	VA	24401	540-885-7281
The News Virginian	P.O. Box 90	Waynesboro	VA	22980	540-949-8213
Nelson County Times	114 North St.	Lovingston	VA	24521	434-385-5555
The Farmville Herald	P.O. Box 412	Farmville	VA	23901	434-392-4151
Dinwiddie Monitor	P.O. Box 412	Sutherland	VA	23385	804-733-8636
Brunswick Times Gazette	P.O. Box 250	Lawrenceville	VA	23868	434-848-2114
Independent Messenger	111 Baker St	Emporia	VA	23847	434-634-4153
Courier Record	111 W. Maple St.	Blackstone	VA	23824	434-292-6397
Suffolk News Herald	130 S. Saratoga St.	Suffolk	VA	23434	757-538-3437
The Virginian Pilot	150 W Brambleton Ave	Norfolk	VA	23510	757-446-9000
New Journal and Guide	5127 E. Virginia Beach Blvd	Norfolk	VA	23502	757-543-6531
Tidewater News	P.O. Box 497	Franklin	VA	23851	757-562-3187
The Free Press	P.O. Box 777	Woodstock	VA	22664	540-459-4000
The Daily Press	703 Mariners Row	Newport News	VA	23606	757-247-4600
Richmond Times Dispatch	300 E. Franklin St	Richmond	VA	23219	804-649-6000
Richmond Free Press	422 e. Franklin St.	Richmond	VA	23219	804-644-0496

6.0 THREATENED AND ENDANGERED SPECIES INFORMATION

The sections below describe the results of survey and consultation with federal, state, and local agencies. Appendix K contains correspondence with agencies and survey result reports.

6.1 FEDERAL AND STATE CONSULTATION

The ACP is a FERC 7c regulated project and the USACE is participating in the pre-filing process as a cooperating agency. FERC is coordinating with the FWS regarding the review of Section 7 Endangered Species Act (ESA) compliance.

Section 7 of the ESA requires Federal agencies to verify that any actions authorized, funded, or carried out by the agencies do not jeopardize the continued existence of a federally listed threatened or endangered species, or result in the destruction or adverse modification of designated critieal habitat for a federally listed species. The law is jointly administered by the FWS, which is responsible for terrestrial and freshwater species, and National Oceanic and Atmospheric Administration (NOAA) Fisheries, which is responsible for marine and anadromous species. As the lead Federal agency for authorizing the ACP, FERC is required to coordinate with the FWS and NOAA Fisheries to determine whether federally listed endangered or threatened species or designated critical habitat are found in the vicinity of the ACP and to evaluate the potential effects of the proposed actions on those species or critical habitat.

For actions involving major construction activities with the potential to affect listed species or designated critical habitat, the FERC must report its findings to the FWS and NOAA Fisheries in a biological assessment (BA) for those species that could be affected. If it is determined that the proposed action is likely to adversely affect listed species or designated critical habitat, the FERC is required to initiate formal consultation with the appropriate Federal agency. Atlantic anticipates that the consultation between FERC, as the lead federal agency, and the FWS will be completed and a final Biological Opinion available for the USACE record in September 2017.

6.2 MIGRATORY BIRD TREATY ACT OF 1918 AND THE BALD AND GOLDEN EAGLE PROTECTION ACT.

In addition to ESA Section 7 compliance, Atlantic coordinated with FWS regarding potential impacts to migratory birds as part of the Migratory Bird Treaty Act (MBTA) of 1918. Atlantic will comply with the applicable portions of both the MBTA and the Bald and Golden Eagle Protection Act. Atlantic plans to clear the pipeline right-of-way outside of the migratory bird nesting season to reduce potential impacts on migratory birds and other sensitive species. In the event that clearing is necessary within the nesting season, Atlantic will avoid impacts to nests observed within the construction right-of-way in accordance with the MBTA. Atlantic has applied for a non-purposeful eagle take permit for potential disturbance of the previously identified bald eagle nest in the City of Chesapeake near project milepost 76.5 on AP-3, the bald eagle nest in Nottoway County, Virginia near project milepost 244.1 on AP-1, and the bald eagle nest in Augusta County, Virginia near project milepost 147.8 on AP-1. The bald eagle nests in the City of Chesapeake and Nottoway County, Virginia fall within the FWS recommended 660-foot no activity buffer, and the bald eagle nest in Augusta County, Virginia falls with the FWS

recommended 0.5-mile no blasting buffer. In the event that an additional active bald eagle nest is identified in the vicinity of the project, Atlantic will adhere to the requirements of the National Bald Eagle Management Guidelines. Atlantic has prepared a draft Migratory Bird Plan evaluating the potential impacts of the ACP which was filed with the FERC on May 5th, 2017, with a copy also going to the FWS and USACE.

6.3 FEDERAL AND STATE LISTED SPECIES

Based on information obtained through the Information, Planning, and Conservation System (IPaC System), National Heritage Inventory (NHI), and agency consultations to date, Atlantic has compiled a preliminary list of 23 federally listed threatened and endangered species that potentially occur within the ACP Project area within the USACE - Norfolk District (Table 6.3-1) and a preliminary list of 26 Commonwealth -listed species with the potential to occur in the ACP Project area in Virginia (Table 6.3-2).

TABLE 6.3-1

Federally Listed Species and Species Proposed for Federal Listing within the U.S. Army Corps of Engineers – Norfolk District

Species	Status[a]	Counties of Potential Occurrence
Mammals		
Gray bat (*Myotis grisescens*)	E	Bath
Indiana Bat (*Myotis sodalis*)	E	Highland, Augusta, and Cumberland
Northern Long-eared Bat (*Myotis septentrionalis*)	T	All Counties Crossed
Virginia Big-eared Bat (*Corynorhinus townsendii virginianus*)	E	Highland
Birds		
Red-cockaded Woodpecker (*Picoides borealis*)	E	Southampton, City of Suffolk
Mussels		
Atlantic pigtoe (*Fusconaia masoni*)	UR	James River basin
Dwarf Wedgemussel (*Alasmidonta heterodon*)	E	Brunswick, Dinwiddie, and Nottoway
James Spinymussel (*Pleurobema collina*)	E	Highland, Buckingham, Cumberland, and Nelson
Yellow Lance (*Elliptio lanceolata*)	UR	Nottoway River, Meherrin River, Sturgeon Creek
Plants		
American Chaffseed (*Schwalba americana*)	E	Greensville
Eastern Prairie Fringed Orchid (*Platanthera leucophaea*)	T	Augusta
Michaux's Sumac (*Rhus michauxii*)	E	Brunswick, Dinwiddie, and Nottoway
Northeastern Bulrush (*Scirpus ancistrochaetus*)	E	Augusta and Highland
Shale Barren Rock Cress (*Boechera serotina*)	E	Augusta and Highland
Small Whorled Pogonia (*Isotria medeoloides*)	T	Augusta and Highland

TABLE 6.3-1

Federally Listed Species and Species Proposed for Federal Listing within the U.S. Army Corps of Engineers – Norfolk District

Species	Status[a]	Counties of Potential Occurrence
Swamp Pink (*Helonias bullata*)	T	Augusta and Nelson
Virginia Sneezeweed (*Helenium virginicum*)	T	Augusta
Invertebrate		
Chowanoke crayfish (*Orconectes virginiensis*)	UR	Greensville, ,Brunswick, Dinwiddie
Madison Cave isopod (*Antrolana lira*)	T	Augusta
Rusty patched bumble bee (*Bombus affinis*)	EP	Entire project area
Fish		
Atlantic sturgeon (*Acipenser oxirinchus*)	E/T	City of Chesapeake
Roanoke Logperch (*Percina rex*)	E	Brunswick, Dinwiddie, Greensville, Nottoway, and Southampton

[a] Abbreviations for species federal status are as follows:
E = Endangered
T = Threatened
UR – Under review
P – Proposed

TABLE 6.3-2

Commonwealth-listed Endangered and Threatened Species Potentially Occurring in the Atlantic Coast Pipeline Area[a]

Species	Status[b]	Areas of Potential Occurrence
Amphibians		
Eastern Tiger Salamander	E	Augusta and Nelson Counties
Mabee's Salamander	T	City of Suffolk
Birds		
Appalachian Bewick's Wren	E	Highland County
Bachman's sparrow	T	Greensville County
Loggerhead Shrike	T	Highland, Augusta, Nelson Counties
Peregrine Falcon	T	Chesapeake County
Freshwater Mussel		
Atlantic Pigtoe	T	Cumberland, Prince Edward, Dinwiddie, Brunswick, Greensville Counties
Mammals		
American Water Shrew	E	Highland, Augusta, and Cumberland Counties
Dismal Swamp Southeastern Shrew	T	City of Suffolk and City of Chesapeake
Rafinesque's Eastern Big-eared Bat	E	Greensville, Southampton, City of Suffolk
Plant		
Raven's Seedbox	R	City of Suffolk
Reclining Bulrush	T	Southampton, Greenville Counties
Torrey's Mountain-mint	R	Nelson County
Valley Doll's Daisy	E	Augusta County
Variable Sedge	R	Augusta and Highland Counties
Virginia Least Trillium	R	City of Suffolk
Reptiles		

TABLE 6.3-2

Commonwealth-listed Endangered and Threatened Species Potentially Occurring in the Atlantic Coast Pipeline Area[a]

Species	Status[b]	Areas of Potential Occurrence
Amphibians		
Eastern Tiger Salamander	E	Augusta and Nelson Counties
Mabee's Salamander	T	City of Suffolk
Birds		
Appalachian Bewick's Wren	E	Highland County
Bachman's sparrow	T	Greensville County
Loggerhead Shrike	T	Highland, Augusta, Nelson Counties
Peregrine Falcon	T	Chesapeake County
Freshwater Mussel		
Atlantic Pigtoe	T	Cumberland, Prince Edward, Dinwiddie, Brunswick, Greensville Counties
Canebrake Rattlesnake	E	City of Suffolk, City of Chesapeake

[a] Potential species in the ACP Project area are based on NHI occurrences within 300 feet of the proposed pipeline routes and response letters from the Virginia Department of Game and Inland Fisheries, dated February 19, 2015.

[b] E – Endangered, T – Threatened, R – Rare

Virginia has separate acts protecting threatened and endangered species. The Virginia ESA (VAC § 29.1-563 to 29.1-570) designates Virginia Department of Game and Inland Fisheries (VDGIF) as the Commonwealth agency with jurisdiction over federally or Commonwealth-listed endangered or threatened fish and wildlife. The Virginia ESA prohibits by regulation the taking, transportation, processing, sale, or offer for sale of those species.

Under the Virginia Endangered Plant and Insect Species Act (VAC § 3.2-1000 et seq.), the taking or possession of endangered or threatened plant and insect species is prohibited except where authorized under a permit or from one's own land. The VDCR represents the Virginia Department of Agriculture and Consumer Services, which is responsible for Commonwealth-listed plants and insects, in providing comments regarding potential effects on Commonwealth-listed plant and insect species.

Atlantic requested and received NHI data for a 2 mile-wide corridor centered on the proposed pipeline centerlines which include the locations of aboveground facilities. This data identifies occurrences of federally listed, and Commonwealth/State-listed species as well as sensitive or significant habitats including parks, forests, or nature preserves located along or adjacent to the proposed pipeline routes.

Atlantic reviewed the IPaC System to determine which federally listed species could occur in the ACP Project area. Additionally Atlantic coordinated with the FWS Ecological Services Field Office (ESFO) in Virginia to introduce the Project and begin discussing potential impacts on federally listed species and designated critical habitat.

Atlantic requested and received data on known occurrences of Commonwealth-listed species in Virginia from the VDCR Natural Heritage Program. Additionally, Atlantic has consulted and continues to consult with the VDGIF and VDCR regarding impacts on Commonwealth-listed threatened and endangered species. A letter from the VDCR was received on November 18, 2014 identifying Natural Area Preserves and conservation sites in the ACP

Project area. A response from the VDGIF was received on February 19, 2015. Correspondence with agencies is located in Appendix K.

Atlantic sent letters to the FWS ESFO in Virginia, FWS ESFO and to the NOAA Fisheries' Office of Protected Resources in August 2014 requesting early coordination and technical assistance based on the species lists obtained through the IPaC System. These letters introduced the Project and begin discussing potential impacts on federally listed species and designated critical habitat, requested verification of the species that could be impacted by the ACP Project, and requested direction on field survey protocols for species-specific surveys.

Through coordination with the FWS ESFO, field survey protocols were developed for red-cockaded woodpecker, Roanoke logperch, all mussels, all bats, and all plants. Based on communications with the FWS ESFO the Madison cave isopod presence is assumed and will be addressed through the development of conservation measures described in a karst protection plan and the ACP's final draft BA. Correspondence logs documenting the coordination with the FWS ESFO are located in Appendix K.

Atlantic will comply with the applicable portions of both the MBTA and the Bald and Golden Eagle Protection Act. Atlantic plans to fell trees within the pipeline right-of-way outside of the migratory bird nesting season to reduce potential impacts on migratory birds and other sensitive species. In the event that clearing is necessary within the nesting season, Atlantic will avoid impacts to nests observed within the construction right-of-way in accordance with the MBTA. In the event that additional active bald eagle nests are identified in the vicinity of the project, Atlantic will adhere to the requirements of the National Bald Eagle Management guidelines to minimize potential impacts on nesting eagles or apply for a federal permit for non-purposeful take of eagles.

Atlantic has prepared a draft BA (version 5) evaluating the potential impacts of the ACP on federally listed species, which was filed with the FERC January 27, 2017, with a copy also going to the FWS and USACE. The draft BA includes a request for NOAA Fisheries' concurrence with a minimal adverse effect determination for Essential Fish Habitat (EFH).

6.4 ESSENTIAL FISH HABITAT

Atlantic is coordinating with NOAA Fisheries and VDGIF to identify waterbodies where time of year restrictions for species of concern are applicable per agency guidance or per NWP 12 general or regional conditions. Atlantic will implement time of year restrictions to construction activities as required by either of these agencies.

The only essential fish habitat along the ACP is located at the Southern Branch Elizabeth River crossing in Virginia. The Southern Branch of the Elizabeth River contains EFH for the egg, larvae, juvenile, and adult life stages of the following species: windowpane flounder (*Scophthalmusaquosus*), bluefish (*Pomatomussaltatrix*), Atlantic butterfish (*Peprilustriacanthus*), summer flounder (*Paralichthysdentatus*), black sea bass (*Centropristisstriata*), king mackerel (*Scomberomorus cavalla*), Spanish mackerel (*Scomberomorusmaculatus*), cobia (*Rachycentroncanadum*), red drum (*Sciaenopsoccelatus*), dusky shark (*Carcharhinusobscurus)*, sandbar shark (*Carcharhinusplumbeus*), and also includes

Habitat Area of Particular Concern for sandbar shark. The Southern Branch Elizabeth River will be crossed via HDD to avoid in-stream impacts to essential fish habitat.

As noted above, Atlantic is planning use of the HDD method for the crossing of the Southern Branch Elizabeth River, which would avoid direct impacts from in-stream excavation on the waterbody. However, impacts on EFH could result from an inadvertent return of drilling fluid, inadvertent hazardous material spills, run-off of sediment from construction areas into the waterbody, or water withdrawals for hydrostatic testing and drilling mud (liquid drilling fluid).

During construction, Atlantic will minimize potential impaets on aquatic resources, including EFH, through implementation of the measures described in the Procedures. Additionally Atlantic has prepared and will implement an SPCC Plan (for prevention and response measures in the event of a spill) and HDD Plan (for response measures in the event of an inadvertent return). If bentonite-drilling fluid is released into the river during an inadvertent release, the volume is expected to be relatively minimal. Additionally, due to the river current, high waterway traffic, high turbidity, and presence of existing pollutants, an inadvertent release will not likely be visible or result in significant impact on EFH.

The ACP will have no adverse effect on EFH or managed species in the Southern Branch Elizabeth River or the Nansemond River and associated tidal wetlands because the pipeline will be installed by HDD. Potential impacts on EFH resulting from an inadvertent return or spill will be minimized by implementation of the Plan and Procedures, SPCC Plan, and HDD Plan. Therefore a minimal adverse effect on EFH is anticipated as a result of the proposed action.

Atlantic has received concurrence from the NOAA Fisheries Northeast Regional Office with a no adverse effect finding for impacts on EFH in the Southern Branch Elizabeth River or the Nansemond River and associated tidal wetlands in Atlantic's final draft BA for the Project.

Water withdrawals from the Southern Branch Elizabeth River are not planned.

6.5 ANADROMOUS FISH USE AREAS

In a letter dated June 1, 2016, the VDGIF stated the following streams within the Project area have been designated as confirmed or potential Anadromous Fish Use Area:

- Confirmed: Elizabeth River, Fountains Creek, Meherrin River, Nottoway River, Blackwater River
- Potential: Nansemond River, Western Branch Elizabeth River, James River, Bernett's Mill Creek.

The 2017 NWP Norfolk District regional condition for Virginia place a time-of-year restriction prohibiting all in-water work in an anadromous fish use area (confirmed or potential) from February 15 to June 30 of any given year, unless the Norfolk District determines the work is minimal and the time-of-year restriction is unnecessary. Hydrostatic testing in designated Anadromous Fish Use Areas will be completed in accordance with the time of year restrictions included in the NWP conditions.

7.0 HISTORIC RESOURCES INFORMATION

The ACP is a FERC 7c regulated project and the USACE is participating in the pre-filing process as a cooperating agency. FERC will be coordinating with the Virginia State Historic Preservation Office for the review of Section 106 of the National Historic Preservation Act compliance, as well as coordinating its government-to-government consultation with federally recognized Indian Tribes. The following sections summarize efforts according to both Section 106 and tribal coordination.

7.1 SECTION 106 CONSULTATION

The FERC is coordinating with the Virginia State Historic Preservation Office for the review of compliance with Section 106 of the National Historic Preservation Act. For the FERC process, the area of potential effect (APE) for archaeological sites was defined horizontally as the proposed pipeline corridor and associated workspace, footprints of aboveground facility sites, and footprints of other work areas; and vertically as the maximum depth of trenching and other excavations or the depth to which evidence of human occupation could be found. The APE for aboveground historic resources was defined to include the proposed pipeline corridor and associated workspace, footprints of aboveground facility sites, and footprints of other work areas. The APE for aboveground historic resources also included viewsheds to and from historic sites along or near the proposed facilities. The linear extent of the viewsheds varied by site depending on changes in topography, vegetation cover, and the presence of structures or other obstructions in sight lines to and from aboveground historic resources.

The reports presenting the results of the cultural resources surveys for the ACP can be provided to the USACE – Norfolk District upon request, along with copies of documentation of State Historic Preservation Office review and comment when they become available. As part of the mitigation for potential impacts to cultural resources, a Plan for Unanticipated Discovery of Historic Properties or Human Remains during Construction has been prepared; it is provided in Appendix L. Atlantic anticipates that the Project decision documents from the SHPO will be finalized and available for the USACE record in September 2017.

7.2 TRIBAL COORDINATION

The ACP is a FERC 7c regulated project and the USACE is participating in the pre-filing process as a cooperating agency. Project introduction letters for the entire ACP/SHP were sent to 15 federally recognized Indian Tribes that might have interest in the Project area based on historic information. See Appendix M for a summary of communications with these Indian Tribes. The 15 federally recognized Indian tribes that were contacted regarding the ACP and/or SHP are listed below:

1. Absentee-Shawnee Tribe of Indians of Oklahoma;
2. Catawba Indian Nation;
3. Cherokee Nation;
4. Delaware Nation;
5. Delaware Tribe of Indians;
6. Eastern Band of Cherokee Indians;

7. Eastern Shawnee Tribe of Oklahoma;
8. Pamunkey Tribe;
9. Seneca-Cayuga Tribe of Oklahoma;
10. Seneca Nation of Indians;
11. Shawnee Tribe;
12. Stockbridge Munsee Community;
13. Tonawanda Band of Seneca Indians of New York;
14. Tuscarora Nation of New York; and
15. United Keetoowah Band of Cherokee Indians.

Atlantic contacted state recognized tribes in the ACP project area in Virginia and North Carolina. The following seven state recognized tribes identified by the North Carolina Commission of Indian Affairs were contacted for the ACP:

1. Coharie Tribe;
2. Haliwa-Saponi Indian Tribe;
3. Lumbee Tribe of North Carolina;
4. Meherrin Indian Tribe;
5. Occaneechi Band of the Saponi Nation;
6. Sappony Tribe; and
7. Waccamaw Siouan Tribe.

The following 10 state recognized tribes identified by the Secretary of the Commonwealth of Virginia Commission of Indian Affairs were contacted for the ACP:

1. Cheroenhaka (Nottoway) Tribe;
2. Chickahominy Tribe;
3. Eastern Chickahominy Tribe
4. Monacan Indian Nation;
5. Mattoponi Tribe;
6. Nansemond Tribe;
7. Nottoway Tribe;
8. Patawomeck Tribe;
9. Rappahannock Tribe; and
10. Upper Mattaponi Tribe.

There are no state recognized Indian tribes in West Virginia.

Atlantic sent introductory Project letters to the Indian tribes which included a Project description and location maps, and invited each tribe to comment on the Project. In addition, the letters requested input from each of the tribes regarding the potential of the Project to affect archaeological sites, burials, and traditional cultural properties of concern to each tribe. Atlantic received confirmation of delivery of all of the letters. Communication with the tribes is ongoing as part of the Section 106 consultation process. Appendix M includes a summary of communications with federally recognized Indian Tribes to date.

8.0 WETLANDS, WATERS, AND DUNES/BEACHES IMPACT INFORMATION

8.1 WATERS OF THE U.S. IDENTIFICATION

Atlantic began conducting field surveys of wetlands and waterbodies during the 2014 field season, on properties where survey permission had been granted by the landowner, to identify and delineate wetlands and waterbodies within the ACP pipeline construction corridors, access roads and other work areas.

The wetland and waterbody delineation study area for the ACP consisted of a 300-foot-wide corridor centered on the proposed pipeline centerlines, a 50-foot-wide corridor centered over access roads, and the property boundary or construction footprint at aboveground facility sites. Atlantic will continue to conduct wetland and waterbody surveys to document wetland and waterbody crossings along the remainder of the proposed pipeline routes, access roads and in other work areas. To date, wetland and waterbody surveys have been completed for approximately 99 percent of the proposed ACP Project in Virginia. Wetland and waterbody surveys will continue until the entire route has been surveyed as survey permissions are obtained.

Appendix B provides a list of the wetlands and waterbodies crossed by the proposed ACP within the Commonwealth of Virginia. For each wetland or waterbody feature the tables include the field survey designation (Feature ID), waterbody name, approximate crossing width, flow regime (perennial, intermittent, ephemeral, or canal/ditch), proposed crossing method, and state water classification, indicates if there is a time of year restriction at the crossing and describes the calculated impact to each resource. In addition, where more than one water feature is proximate to another to not be separate and distant, Atlantic has combined these features under common single and complete project IDs to facilitate USACE review, see Table B-2 of Appendix B. Subaqueous land crossings are also identified in Table B-1 of Appendix B. Waterbodies that were not surveyed in the field due to a lack of survey permission or recent changes to the proposed pipeline routes were identified based on the National Hydrography Dataset and/or recent aerial photography. These features are designated as "NHD" in the Feature ID column of each table. In addition, Figures A-3 and A-4 in Appendix A illustrate the location of wetlands and waterbodies delineated on 7.5-Minute USGS topographic maps, and aerial photography maps, respectively.

Wetlands were delineated in accordance with the *1987 Corps of Engineers Wetlands Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region* (Version 2.0) or the *Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Atlantic and Gulf Coastal Plain Region* (Version 2.0)), as appropriate. Observations of vegetation, hydrology, and soils were recorded, and photographs were taken at each wetland. Atlantic has requested a preliminary jurisdictional determination from Norfolk District. The wetland and waterbody delineation report and supporting datasheets are included in Appendix N.

A summary description of the direct and indirect environmental effects to waterbodies and wetlands within the Commonwealth of Virginia that will result from the construction of the Project is provided in Section 9.2 and 9.3. In order to minimize environmental impacts during construction, Atlantic developed a SPCC Plan which is provided in Appendix H.

There will be no dune or beach impacts associated with the ACP.

8.2 PERMANENT CONVERSION AND CUMULATIVE IMPACTS UNDER USACE NWP 12

As part of the USACE evaluation of the single and complete projects of Waters of the U.S. for applicability of coverage under NWP 12, the USACE must determine if the individual and cumulative impacts on the aquatic environment are no more than minimal after considering mitigation including compensatory mitigation for unavoidable impacts. The single and complete crossing impacts are presented by HUC 8 watershed in Appendix B.

Atlantic has ensured that impacts associated with single and complete projects are no more than minimal by avoiding impacts to higher ecological value Waters of the U.S. through the following activities:

- narrowing the construction corridor width in wetlands to 75 feet and otherwise minimizing impacts to the maximum extent practicable, including minimizing the duration of construction through wetlands and the long-term conversion by implementing FERC procedures (i.e., minimizing clearing to 10 feet along the pipeline centerline to maintain an herbaceous wetlands condition and minimizing trimming to 15 feet either side of the pipeline centerline for larger trees); and

- providing compensatory mitigation for wetlands within both the 30 foot permanently maintained right of way (15 feet on either side of the pipeline centerline) and the temporarily disturbed right of way by reseeding with native wetland seed mix and leaving tree stumps to remain and regenerate,

    - for permanent conversion of Palustrine System Forested Wetland Class (PFO) to Palustrine System Scrub-Shrub Wetland Class (PSS) at a 1:1 mitigation ratio;

    - for permanent conversion of PSS to Palustrine System Emergent Wetland Class (PEM), reseeded with native wetland seed mix, at a 1:1 mitigation ratio;

    - for permanent loss of PFO, PSS, and PEM at a 2:1 mitigation ratio;

    - for permanent conversion of PFO to either PSS or PEM at a 1:1 mitigation ratio;

    - for temporary right-of-way impacts resulting from the conversion of forested and to scrub-shrub wetlands or to emergent wetlands by reseeding with native wetland seed mix and leaving the tree stumps to remain and regenerate; and

    - for loss of wetlands as a result of a proposed M&R above ground facility and access roads at a 2:1 mitigation ratio.

As with all impact evaluations under the NWP program, the determination whether there will be no more than minimal cumulative adverse impacts on the aquatic environment is made after considering proposed mitigation (Preamble to 33 Code of Federal Regulations (CFR) 330; 1991 NWPs – 56 FR 59118-59119). Furthermore, based on the level of permanent conversion impacts occurring within each HUC 8 watershed, and the fact that all permanent conversion impacts to non-inundated deciduous hardwood wetlands (e.g., bottomland hardwood, hardwood riparian, and hardwood flat wetlands) will be offset by compensatory mitigation, the cumulative impacts to the aquatic environment have been reduced to no more than minimal as described in Sections 9.2 and 9.4 of this Joint Permit Application Supplemental Information document.

The Preamble of the March 2012 NWP issuance package also indicates that cumulative effects will normally be evaluated on a watershed basis.

"Each separate and distant crossing should be evaluated to determine if it meets the terms and conditions of the NWP, and cumulative effects of the overall utility line should be evaluated to determine if the adverse cumulative effects on the aquatic environment are more than minimal and therefore do not qualify for NWP authorization. Separate utility line crossings are usually on different water bodies, and may also be in widely separated watersheds. Such factors should be considered when assessing cumulative impacts." (77 Federal Register [FR] 10196)

"For single and complete linear projects, each separate and distant crossing of a waterbody, as well as each crossing of other waterbodies along the corridor for the linear project may be permitted by separate NWP authorizations. The acreage and other applicable limits for an NWP would be applied to each crossing, as long as those crossings are far enough apart to be considered separate and distant. District engineers will evaluate the cumulative effects of those linear projects when determining whether authorization by NWP is appropriate. The approach to cumulative effects analysis for linear projects is little different than the cumulative effects analysis for other types of NWP activities, including those circumstances in which more than one NWP is used to authorize a single and complete non-linear project, because cumulative effects are evaluated on a regional basis. Cumulative effects analysis may be done on a watershed basis, or by using a different type of geographic area, such as an ecoregion." (77 FR 10264)

The Preamble of the January 6, 2017 NWP Program Final Rule states in addition:

"We are retaining the ½-acre limit for this NWP because we believe it is an appropriate limit for authorizing most utility line activities that have no more than minimal individual and cumulative adverse environmental effects. Division engineers can modify this NWP on a regional level to reduce the acreage limit if necessary to ensure that no more than minimal adverse environmental effects occur in that region. We do not agree that the acreage limit should apply to the entire utility line because the separate and distant crossings of waters of the United States are usually at separate waterbodies scattered along the length of the utility line, and are often in different watersheds especially for utility lines that run through multiple counties, states, or Corps districts. For utility lines that cross the same waterbody (e.g., a river or stream) at separate and distant locations, the distance between those crossings will usually dissipate the direct and indirect adverse environment effects so that the cumulative adverse

environmental effects are no more than minimal. If the district engineer determines after reviewing the PCN that the cumulative adverse environmental effects are more than minimal, after considering a mitigation proposal provided by the project proponent, he or she will exercise discretionary authority and require an individual permit." (FR Notice, January 6, 2017 Final Rule Preamble p1885)

The USACE 2008 Mitigation Rule at 33 CFR 332.8(d)(6)(ii)(A), provides that normally mitigation service areas would be at the HUC 8 watershed level. VAC 62.1-44:15.23 provides that HUC 8 or adjacent within the same major river tributary may be used as a service area. Using only HUC 8 for the cumulative impact analysis is further supported as this is smaller than used in Virginia for mitigation purposed. HUC 8 has been used as the size of watershed in which to present the cumulative impacts of the proposed Project.

The majority of the potential Project impacts to Waters of the U.S. are turbidity, resulting from the temporary discharge of earthen fill material associated with trench excavation for pipeline installment within the rights-of-way. Furthermore, to facilitate construction equipment for pipeline installation, forested and scrub-shrub wetlands would be cleared and stumps removed where required for safe passage during pipeline installment. Where temporary discharges of fill or excavation is necessary, Atlantic will immediately restore the wetland to its pre-construction contours. The center 30-feet of the cleared rights-of-way that previously consisted of forested wetlands will be permanently maintained free of trees. The center 10-feet of the cleared rights-of-way that previously consisted of forested and scrub-shrub wetlands will be permanently maintained in an herbaceous state. This maintenance for the life of the project, while not resulting in a loss of wetlands, will result in a permanent change of wetland function and value, which would otherwise exist had the vegetative cover of the wetland not been altered. These functional losses will be offset by proposed compensatory mitigation at a 1:1 ratio for non-inundated deciduous hardwood wetlands. This has been described as permanent conversion in associated tables.

Permanent impacts (i.e., permanent loss of wetlands.), although minimized and avoided to the maximum extent practicable, will be necessary to accommodate the construction of a permanent facility and access roads. Atlantic has taken great steps to avoid all permanent impacts, however, 0.08 acre of PFO wetland are proposed to be permanently filled for the Elizabeth River M&R station. Additionally, 0.96 acres of wetlands are proposed to be permanently filled as a result of construction and improvements for permanent access roads. Existing access roads are being utilized where feasible, however in many cases the existing access roads in wetlands need to be improved requiring gravel to be placed on top of the existing access road in wetlands, which has been considered an additional fill or loss. Where access road improvements are necessary for use, Waters of the U.S. loss impacts have been minimized to the maximum extent practicable, and have been kept below 1/3 acre at each single and complete project. The mainline pipeline will result in permanent conversion of 74.1 acres of PFO wetlands to PSS or to PEM wetlands, 292.12 acres of temporary impacts, and 1.04 acres of permanent wetland losses will occur as a result of construction of a permanent facility and access roads. No loss to wetlands will exceed the 0.5 acre NWP 12 threshold including the 1/3 acre threshold for access roads associated with NWP 12 at each single and complete project (crossing).

The temporary impacts and permanent conversion impacts of the proposed Project are provided in Appendix B Tables B-3 and B-4 by HUC 8 watershed. Despite minor loss of wetlands resulting from a proposed M&R facility, access road improvements, and the impacts of wetland type conversion from palustrine forested wetland to scrub-shrub or emergent wetland, Atlantic's proposed compensatory mitigation plan will provide for impact offsets for permanent wetland losses and wetland conversion, both temporary and permanent, such that there will be no more than minimal adverse impacts on wetlands. ACP anticipates submitting a conceptual mitigation plan to USACE by September, 2017.

Assessment of cumulative effects also involves a general characterization of impacts to Waters of the U.S. from similar types of projects in the past and reasonably foreseeable future. The area that the pipeline will traverse largely involves a mix of small community development, agricultural use and open undisturbed forested land. Past impacts would be those of typical rural development with road and various utility line crossings of streams and wetlands in support of agriculture and dispersed human development. Reasonably foreseeable impacts would include continued slow additional growth in the small human communities with associated road and utility line crossings of Waters of the U.S.

As provided in the USACE 2017 NWP issuance document at 82 FR 1860, cumulative impacts to the human environment other than impacts to Waters of the U.S. will be evaluated by FERC in its NEPA EIS process.

"Even though an environmental impact statement may be prepared for a particular utility line, the National Environmental Policy Act process does not prohibit the Corps from using NWP 12 to authorize the construction, maintenance, repair, and removal of utility lines and associated facilities in waters of the United States, as long as the activity complies with all applicable terms and conditions and results in minimal individual and cumulative adverse effects on the aquatic environment. NEPA requires consideration of all environmental impacts, not only those to aquatic resources, so there may well be situations where aquatic impacts are minimal even though environmental impacts more generally are not. These other environmental impacts would be addressed by the lead agency preparing the environmental impact statement."

The purpose of the proposed pipeline is to transport natural gas from West Virginia and Pennsylvania to use in areas of Virginia and North Carolina. Other pipelines, subject to future approvals with mitigation as appropriate and practicable, may be required to transport natural gas from source areas such as the Marcellus Shale and Utica Shale formations that may in the future be produced from the Marcellus Shale and Utica Shale formations. Other pipeline development in the areas traversed by the Project would involve mostly temporary impacts on Waters of the U.S. that would be restored after pipeline construction is completed. Permanent loss and wetland conversion impacts of Waters of the U.S. would be mitigated to achieve no more than minimal impact through USACE and State permit actions offsetting the impacts on streams and wetlands. Moreover, USACE Headquarters evaluated the cumulative impacts on Waters of the U.S. in its decision document supporting reissuance of NWP 12 in 2017. The USACE evaluation of impacts nationwide determined that there would be no more than minimal cumulative impacts on Waters of the U.S. Part of the USACE Headquarters evaluation of cumulative impacts identified that USACE districts would evaluate cumulative impacts on Waters of the U.S. of the "overall pipeline project" it authorized based on evaluation of impacts on the aquatic environment on a

watershed basis. The USACE Headquarters cumulative impact evaluation was partially based on full restoration of temporary impacts, districts requiring compensatory mitigation for permanent loss of waters and conversion impacts such as the compensatory mitigation proposed by Atlantic for the ACP and that high ecological value aquatic areas would be avoided as has been done on the Project through coordination with the USACE districts.

Based on the fact that the majority of the overall pipeline project impacts to wetlands and waterbodies are temporary with restoration of aquatic areas immediately after construction and that permanent impacts, comprised of permanent conversion of forested scrub-shrub wetlands to other wetland types and small above ground facility and road fills, will be mitigated, the impacts at each single and complete project will be result in no more than minimal impact to Waters of the US. both individually and cumulatively. Furthermore, the proposed impacts including loss of Waters of the U.S. at each single and complete project qualify for NWP 12 threshold of impacts to Waters of the U.S. in Virginia. The fact that these impacts, resulting in no more than minimal impact to wetlands and waterbodies, at each single and complete project, are spread widely over numerous watersheds and over approximately 307 miles in Virginia, clearly indicates that the cumulative impacts of the overall pipeline project to wetlands and waterbodies will be no more than minimal as well. Therefore, the cumulative impacts of the overall pipeline project in Virginia on each HUC 8 watershed are not of a nature and extent that would result in the requirement of an individual permit for the Project. The temporary impacts, permanent conversion impacts, and loss impacts for wetlands, streams, and other waters for the proposed Project are provided in Appendix B, Tables B-3 and B-4 by HUC 8 watershed; these tables roll up the aquatic impacts for each HUC 8 watershed.

As provided in the Preamble of the January 6, 2017 USACE 2017-2022 NWP Program Final Rule:

"We are retaining the long-standing practice articulated in the NWP regulations at 33 CFR 330.2 (i), which each separate and distant crossing of waters of the United States is authorized by NWP. ....For the purposes of this NWP, the term "crossing" refers to regulated activities. ...The substations, tower foundations, roads, and temporary fills that are also authorized by NWP 12 (when those activities require DA authorization) are integral to the fulfilling the purpose of utility lines, and thus fall within the "categories of activities that are similar in nature" requirement for general permits stated in section 404(e) of the CWA." .... The Corps does not regulate oil and gas pipelines, or other types of pipelines, per se. For utility lines, including oil and gas pipelines, our legal authority is limited to regulating discharges of dredged or fill material into waters of the United States and structures or work in navigable waters of the United States, under section 404 of the Clean Water Act and section 10 of the Rivers and Harbors Act of 1899, respectively. We do not have the authority to regulate the operation of oil and gas pipelines, and we do not have the authority to address spills or leaks from oil and gas pipelines. In addition, we do not have the legal authority to regulate the construction, maintenance, or repair of upland segments of pipelines or other types of utility lines. For example, for a recent oil pipeline (e.g., the Flanagan South pipeline), the segments of the oil pipeline that were subject to the Corps' jurisdiction (i.e., the crossings of waters of the United States, including navigable waters of the United States, that were authorized by the 2012 NWP 12) was only 2.3% of the total length of the pipeline; the remaining 97.7 percent of the oil pipeline was constructed in upland areas outside of the Corps' jurisdiction. Interstate natural

gas pipelines are regulated by the Federal Energy Regulatory Commission. The Federal Energy Regulatory Commission also regulates some electric transmission projects. There are other federal laws that address the operation of pipelines and spills and leaks of substances from pipelines. Those laws are administered by other federal agencies." (FR Notice, January 6, 2017 Final Rule Preamble pp. 1883-1884)

8.3 WATERBODY IMPACTS

After the avoidance and minimization efforts employed during routing and route refinement described in Section 3.9 as well as construction planning and design described in Section 3.7 and 3.8, within the Commonwealth of Virginia, a total of 855 waterbody segments will be intersected by mainline pipeline construction workspace, access roads, aboveground facilities, or construction staging areas for the ACP. In addition, 49 waterbodies meet the requirements of VMRC subaqueous lands crossings, having a perennial flow regime and a five-square-mile or greater contributing watershed. An additional three waterbodies are tidally influenced (Western Branch Nansemond River, Nansemond River, and Southern Branch of the Elizabeth River). Potential impacts associated with these crossings are listed in the impact tables in Appendix B.

Impacts on individual waterbodies crossed by the proposed ACP facilities could occur as a result of construction activities in stream channels and on adjacent banks. Potential impacts on waterbodies and minimization or mitigation measure that will be utilized are described below.

Clearing and grading of stream banks, blasting (if required), in-stream trenching, trench dewatering, and backfilling could each result in temporary, local modifications of aquatic habitat involving sedimentation, increased turbidity, and decreased dissolved oxygen concentrations. In almost all cases, these impacts will be limited to the period of in-stream construction, and conditions will return to normal shortly after stream restoration activities are completed. In addition, implementation of the best management procedure outlined in the FERC Plan and Procedures will help minimize impacts on waterbodies.

Vegetative clearing, grading for construction, and soil compaction by heavy equipment near stream banks could promote erosion of the banks and the transport of sediment into waterbodies by stormwater runoff. To minimize these potential impacts, Atlantic will install equipment bridges, mats, and pads, as necessary. Additionally, Atlantic will locate ATWS at least 50 feet from the top of stream banks (with the exception of site-specific modifications requested by Atlantic and approved by the FERC). Temporary sediment barriers will be installed around disturbed areas as outlined in the Plan and Procedures. Upon completion of construction, Atlantic will install approved permanent erosion control measures at stream crossing locations to provide long-term protection of water quality according to the Plan and Procedures and permit requirements.

Sedimentation and increased turbidity can occur as a result of in-stream construction activities, trench dewatering, or stormwater runoff from construction areas. In slow moving waters, increases in suspended sediments (turbidity) may increase the biochemical oxygen demand and reduce levels of dissolved oxygen in localized areas during construction. Suspended sediments also may alter the characteristics of the water column (e.g., color and clarity) on a

temporary basis. Atlantic will use material excavated from the pipeline trench to backfill the trench once the pipe is installed to avoid introduction of foreign substances into waterbodies.

Atlantic will install temporary equipment bridges to reduce the potential for turbidity and sedimentation resulting from construction equipment and vehicular traffic crossing waterbodies. Temporary bridges will be installed across waterbodies in accordance with the Procedures to allow construction equipment and personnel to cross. The bridges may include clean rock fill over culverts, timber mats supported by flumes, railcar flatbeds, flexi-float apparatuses, or other types of spans. Construction equipment will be required to use the bridges, except that the clearing and bridge installation crews will be allowed one pass through waterbodies before bridges are installed. The temporary bridges will be removed when construction and restoration activities are complete, within 12 months of commencing the construction, unless the bridge spans the ordinary high water mark of the waterbody, or unless an extension is approved by an authorized Norfolk District representative. After the pipeline is installed across a waterbody using one of the methods described above, the trench will be backfilled with native material excavated from the trench. Any temporary fill will be removed. The streambed profile will be restored to pre-construction contours and grade conditions to prevent scouring. The stream banks will then be restored as near as practicable to preconstruction conditions and stabilized. Waters which have been temporarily disturbed by construction activities will be restored to their pre-construction contours within 12 months of commencing the temporary impact's construction. Stream bank stabilization measures would include seeding, installation of erosion control blankets, or installation of riprap materials, where appropriate, as outlined in the FERC Plan and Procedures and the ACP Restoration and Rehabilitation Plan (Appendix I). Riprap will be installed above the ordinary high water line, or if required below the ordinary high water line coordinated for review and approval hy an authorized Norfolk District representative. Temporary erosion controls will be installed immediately following bank restoration. The waterbody crossing area will be inspected and maintained until restoration of vegetation is complete.

During construction, the open trench may accumulate water, either from a high water table and seepage of groundwater into the trench or from precipitation. In accordance with the Plan and Procedures, and when necessary, trench water will be removed and discharged into an energy dissipation/sediment filtration device, such as a geotextile filter bag and/or straw bale structure, to minimize the potential for erosion and sedimentation.

In areas where concrete-coated pipe is required, and in accordance with the SPCC Plan, concrete coating activities conducted in the field will occur a minimum of 100 feet from wetlands, waterbodies, springs, and 300 feet from karst features. [6] Concrete-coated pipe will be installed after the concrete is dried and will not be dispersed when submerged in water.

As required in the Procedures and the SPCC Plan, hazardous materials, chemicals, lubricating oils, and fuels used during construction will he stored in upland areas at least 100 feet from wetlands and waterbodies. Refueling of construction equipment will be conducted at least

[6] In comments filed with the Commission, the Virginia Department of Game and Inland Fisheries said that in-stream use of concrete should be done only in dry conditions, allowing all concrete to harden prior to returning stream flow

100 feet from wetlands and waterbodies, whenever possible. However, there will be certain instances where equipment refueling and lubricating may be necessary in or near waterbodies. For example, stationary equipment, such as water pumps for withdrawing hydrostatic test water, may need to be operated continuously on the banks of waterbodies and may require refueling in place. The SPCC Plan will address the handling of fuel and other materials associated with the ACP. As required by the Procedures, the SPCC Plan will be available during construction on each construction spread.

It is possible that previously undocumented sites with contaminated soils or groundwater could be discovered during construction of the ACP. Atlantic will implement a Contaminated Media Plan to address these circumstances. The Contaminated Media Plan will describe measures to be implemented in the event that signs of contaminated soil and/or groundwater are encountered during construction. Signs of potential contamination could include discoloration of soil, chemical-like odors, or sheens on soils or water. Containment measures will be implemented to isolate and contain the suspected soil or groundwater contamination and collect and test samples of the soil or groundwater to identify the contaminants. Once the contaminants are identified, a response plan will be developed for crossing or avoiding the site.

Once construction is complete, the pipeline will be buried below the ground surface and preconstruction contours will be reestablished; therefore, the pipeline will not impact water retention or floodplain storage within riparian corridors. Atlantic is routing the proposed pipelines to avoid sharp angle crossings or crossing streams where high stream energy could result in bank erosion. Atlantic will implement measures outlined in the Procedures to minimize impacts on the waterbodies crossed, including the installation of trench plugs to prevent water from flowing along the trenchline during and after construction. These measures will minimize potential impacts on surface and below ground hydrology. Waterbody crossings will be in accordance with the requirements identified in the federal or Commonwealth waterbody crossing permits obtained for the ACP.

During operations, the proposed pipelines will transport natural gas, which consists primarily of methane. Methane is buoyant at atmospheric temperatures and pressure, and disperses rapidly in air. The proposed pipelines will not carry liquids. Therefore, in the unlikely event of a leak, impacts on surface waters or groundwater from methane are not anticipated. Moreover, Atlantic will utilize a rigorous Integrity Management Plan to prevent leaks on the system. Additional details on the Integrity Management Plan are available through the FERC Project Docket (No. CP15-554-000).

The impacts associated with construction are planned to occur in an expedient and efficient manner such that impacts on the waterbody and its banks are temporary in nature. In addition, while there are numerous single and complete projects across the ACP in Virginia, the single and complete projects are distributed across many watersheds. There are 0.37 acres of waterbodies proposed to be permanently filled as a result of construction and improvements for permanent access roads. Existing access roads are being utilized where feasible, however in many cases the existing access roads need to be improved requiring gravel to be placed on top of the existing access road in waterbodies, which has been considered an additional fill or loss. Where access road improvements are necessary for use, Waters of the U.S. loss impacts have been minimized to the maximum extent practicable, and have been kept below 1/3 acre at each

single and complete project. Table B-3 summarizes the impacts on waterbodies by basin and sub-basin (HUC 6 and HUC 8, respectively). Based on the short duration and distant nature of the waterbody crossings, Atlantic anticipates that cumulative impacts will result in no more than minimal adverse impacts to the basin and sub-basins crossed.

8.4 LAND USE PROTECTIVE INSTRUMENTS

The ACP will cross a number of wetlands, open water, or streams which are under a deed restriction, conservation easement, restrictive covenant, or other land use protective instrument, see Table 8.4-1. Atlantic has been actively meeting with various agencies to avoid crossing easements to the full extent possible.

TABLE 8.4-1

Easements Crossed by the Atlantic Coast Pipeline in the Commonwealth of Virginia [a]

Facility/County or City/State or Commonwealth	Begin Milepost [b]	End Milepost	Crossing Length (miles)	Type	Ownership
AP-1					
Highland, VA	90.4	91.1	1.0	VOF (Teague)	VOF
Bath, VA	95.3	96.1	1.1	VOF (Normandy Capitol)	VOF
Bath, VA	99.7	100.4	1.1	VOF (Rice)	VOF
Bath, VA	100.6	100.7	0.1	VOF (Chandler)	VOF
Bath, VA	103.6	104.2	0.9	VOF (Revercomb)	VOF
Bath, VA	104.2	104.6	0.7	VOF (Koontz)	VOF
Bath, VA	104.6	105.3	1.1	VOF (The Wilderness, LLC)	VOF
Bath, VA	106.1	106.5	0.3	VOF (Bright and Wilfong)	VOF
Bath, VA	106.6	106.8	0.2	VOF (Berry)	VOF
Augusta, VA	106.7	106.8	0.1	VOF (Berry)	VOF
Nelson, VA	173.5	173.9	0.3	VOF (Saunders)	VOF
Dinwiddie, VA	253.5	254.3	0.8	Ward Burton Wildlife Foundation (WBWF)	WBWF
Dinwiddie, VA	254.6	254.7	0.1	WBWF	WBWF
Dinwiddie, VA [c]	255.1	255.9	0.7	VOF (Scott Timberland)	VOF
Dinwiddie, VA	256.5	256.7	0.2	WBWF	WBWF
Dinwiddie, VA	257.8	259.3	1.4	WBWF	WBWF
Brunswick, VA	260.7	261.9	1.2	WBWF	WBWF
Brunswick, VA	261.9	262.3	0.4	WBWF	WBWF
Brunswick, VA	274.4	274.4	<0.1	Tobacco Heritage Trail Conservation Easement	VA DCR
Total Easements Crossed			**12.1**		

TABLE 8.4-1

Easements Crossed by the Atlantic Coast Pipeline in the Commonwealth of Virginia [a]

Facility/County or City/State or Commonwealth	Begin Milepost [b]	End Milepost	Crossing Length (miles)	Type	Ownership

[a] This table only includes current not proposed easements

[b] The mileposts used in the FERC Application, which was filed on September 18, 2015 (FERC Accession Number 20150918-5212), were based on three-dimensional changes in topography along the proposed pipeline routes. In areas where a pipeline route has changed due to the adoption of an alternative, the mileposts in the affected area have been scaled to account for the resulting difference in the length of the route. The straight-line distance between consecutive mileposts as indicated or depicted in tables and figures in this filing may be greater than or less than 5,280 feet. The mileposts should be considered as reference points only.

[c] The easement agreement for this easement allows for the ACP to cross this property.

The VOF is a Commonwealth-created entity that acquires conservation easements and manages other public lands for the purpose of preserving open space in Virginia, protecting over 700,000 acres of land (VOF, 2014). Atlantic is working with the VOF for crossing agreements of the crossings that do occur.

The U.S. Army in 2007 initiated a program of property and/or easement acquisition within a 3- to 4-mile zone surrounding the Fort Pickett Military Reservation for purposes of limiting certain types of development (e.g., cell phone towers, urban sprawl, or light pollution) that could be incompatible with Fort Pickett's military mission. In addition to furthering this goal, the limitations on development also promote wildlife conservation. The program, termed the Army Compatible Use Buffer Program, has acquired properties of easements covering over 2,600 acres around the Fort (Virginia National Guard, 2014). Acquisition for the program continues through collaboration between the Virginia Army National Guard and the Ward Burton Wildlife Foundation (WBWF, 2015). Currently, the proposed AP-1 mainline route crosses parcels in Dinwiddie and Brunswick Counties, Virginia that have been purchased by the WBWF under this program (see Table 9.4-1). Atlantic received a letter on November 14th, 2016 stating that the project is compatible with the purpose of the Fort Pickett Army Compatible Use Buffer (ACUB) Program, and that the routes of the pipeline do not produce any significant risk to current or future planned military operations at the installation. The memorandum additionally ahtorized the WBWF to proceed with negotiating for an easement for the pipeline to cross the ACUB without further review by the U.S. Army National Guard. Atlantic has secured easement agreements with the WBWF to cross the WBWF properties in the ACUB.

8.5 DITCHES

Several human-altered ditches were identified during field surveys as potentially jurisdictional features. These ditches and the locations along the ACP project route within the Norfolk District are summarized in Table 8.5-1, and illustrated on maps included in Appendix A.

8.6 WETLAND IMPACTS

After the avoidance and minimization efforts employed during routing and route refinement, and designing all wetland crossings to meet the NWP 12 no more than minimal impact criteria, as well as construction planning and design described in sections 3.7 through 3.8, there will be a total of 659 wetlands crossed by the ACP mainline construction, aboveground

facilities, access roads, and construction staging areas within Virginia. Where the route crosses a single wetland more than once, and where these are not separate or distant crossings, each crossing has been combined to be represented as a single and complete project in Table B-2 in Appendix B.

TABLE 8.5-1

Atlantic Coast Pipeline Project – Commonwealth of Virginia
Non-tidal Ditches in Virginia

Facility/County	Unique ID	Latitude	Longitude
AP-1			
Highland			
	dhic001	38.307789	-79.425301
Augusta			
	daub100	38.026749	-78.995041
Greensville			
	dgra001	36.742691	-77.652855
	dgra002	36.742195	-77.652534
	dgrc001	36.659103	-77.587379
Southampton			
	dsoa006	36.626648	-77.148071
	dsoc001	36.642735	-76.970566
	dsoc002	36.643799	-76.964432
	dsoa001	36.638935	-76.936554
	dsoa002	36.638893	-76.936462
	dsoa003	36.639378	-76.935387
	dsoa004	36.638138	-76.929176
	dsoa005	36.636387	-76.927727
Suffolk			
	dsua001	36.634529	-76.876122

8.6.1 Tidal Wetlands

Atlantic has coordinated with the VMRC regarding tidal wetlands determinations within the ACP project area and completed site visits to verify tidal wetland determinations. Appendix O contains a letter summarizing the results of correspondence and site visits associated with tidal wetlands determinations for the ACP. While approximately 15 tidally influenced wetlands delineated or included in the Project data are crossed, the majority of these tidal wetlands will be avoided via HDD of the Western Branch Nansemond and Nansemond River crossings. However, there will be 67,953 square feet of temporary impact to tidal wetlands (1.56 acres) as a result of the proposed pipeline work.

8.6.2 Non-Tidal Wetland Impacts

The combined linear crossing distance of all wetlands within the Commonwealth of Virginia is 158,352 feet, accounting for approximately 10.4 percent of the combined length of the pipeline routes within the district. In total, approximately 292.1 acres of wetlands will be temporarily impacted by construction of the ACP mainline pipeline and aboveground facilities within Virginia.

- limiting post-construction maintenance of wetland vegetation to removal of trees with roots that could compromise the integrity of the pipeline within 15 feet of the pipeline centerline, and the maintenance of a 10-foot wide corridor centered over the pipeline as herbaceous wetland vegetation;

- annual monitoring of the success of wetland reestablishment following construction until wetland reestablishment is successful in accordance with the FERC Procedures; and

- at the end of three years after construction as required by the FERC Procedures, active management for any wetland where revegetation is not successful by developing and implementing a reestablishment plan or appropriate remedial action, in consultation with a professional wetland ecologist, to actively revegetate wetlands.

Based on FERC Procedures, restoration/revegetation of wetlands will be considered successful when the affected wetland satisfies the Federal definition of a wetland (i.e., soils, hydrology, and vegetation): vegetation is at least 80 percent of the cover documented for the wetland prior to construction, or at least 80 percent of the cover in adjacent, undisturbed areas of the wetland; or the plant species composition is consistent with early successional wetland plant communities in the affected ecoregion (if natural rather than active revegetation is used); and invasive plant species are no more than 5 percent of the cover, unless they are abundant in adjacent areas that were not disturbed by construction.

The impacts associated with construction are planned to occur in an expedient and efficient manner such that impacts on the wetlands are minimized to the extent practicable, and long-term impacts are associated with minimal conversion of type but not loss of wetlands (loss of wetlands will result from permanent M&R aboveground facility and permanent access roads). Table B-4 summarizes the impacts on wetlands by basin and sub-basin (HUC 6 and HUC 8, respectively). Based on the short duration of construction thru wetlands and minimization of long-term conversion by implementing FERC procedures, Atlantic anticipates that cumulative impacts will result in no more than minimal adverse impacts to the basin and sub-basins crossed.

8.7 COMPENSATORY MITIGATION

In order to authorize any activity under the NWP Program the USACE must determine that the proposed activity in Waters of the U.S. meets the terms and conditions of the relevant NWP, in this case NWP 12, which allows no more than 0.5 acre of loss of Waters of the U.S. for a single and complete project in the Norfolk District, with no more than 1/3 acre loss of Waters of the U.S. due to access road impacts. Furthermore, provided the activity meets the terms and conditions of NWP 12, USACE must determine that the activity will result in no more than minimal (USACE 2017-2022 NWP Program Final Rule) individual or cumulative impacts on the aquatic environment ***AFTER*** considering proposed compensatory mitigation. Such impacts would include the conversion impacts from one type of water of the U.S. to another type of water of the U.S. As stated in the Preamble to the 1991 NWP rule (56 FR 59118-59119) mitigation can be used to reduce impacts to the aquatic environment to the minimal level:

"In response to the comments concerning whether the District Engineer should allow an activity to proceed under a relevant NWP when the mitigation reduces the adverse environmental effects to the minimal level (the "buy down" or "write down" concept), we believe it is indeed appropriate for the District Engineer to consider mitigation in determining whether the proposed activity will result in no more than a minimal level of adverse environmental effects." and "In summary, the net impact concept regarding the determination of minimal is consistent with NEPA, the Army/EPA Mitigation MOA and the Section 404(b)(1) Guidelines as they pertain to general permits."

Permanent loss of wetlands is not proposed for the ACP mainline construction in Virginia. However, 0.08 acre of loss of wetlands will occur as a result of one aboveground facility and as a result of access road improvements. Existing access roads have been utilized where feasible. Where access road improvements are necessary for use, Waters of the U.S. loss impacts have been minimized to the maximum extent practicable, and kept below 1/3 acre impact threshold at single and complete projects.

Atlantic will compensate for the permanent conversion of palustrine forested wetlands to scrub-shrub and to emergent wetlands and for permanent conversion of scrub-shrub wetlands to emergent wetlands, due to maintenance along the centerline of the ACP right-of-way, and for permanent losses of wetlands and waterbodies at facility sites and access roads through the use of the most environmentally preferable options consistent with the Mitigation Rule (33 CFR 332.1 et. seq.). Atlantic is considering the purchase of commercially available mitigation credits from an IRT-approved mitigation bank as a first option. Where sufficient quantity to satisfy the respective mitigation need, in-kind mitigation bank credits will be purchased from mitigation banks with released credits servicing the affected areas (HUC 8 watershed, or approved service area) where the permanent conversion of non-inundated deciduous hardwood wetlands or loss of wetlands, streams, and other waters occurs.

In the event that a permanent conversion or loss of jurisdictional wetlands or waterbodies occurs in a sub-watershed where sufficient released mitigation bank credits are not available, Atlantic will conduct in Virginia permittee responsible mitigation (PRM). Atlantic is coordinating with the Norfolk District to utilize Phase II of the approved Cheroenhaka Mitigation Bank , which is not constructed, as a PRM site. Atlantic will coordinate the proposed Mitigation Plan with Norfolk District. Atlantic will be implementing a PRM project in order to compensate for impacts within the specific HUCs in the Chowan watershed. Atlantic will be providing a detailed PRM plan for review and approval by the USACE as part of its compensatory mitigation plan supplement to this JPA.

Atlantic will be, consistent with the Mitigation Rule, evaluating mitigation options to determine which may be the most preferable.

Atlantic has completed research to identify wetland mitigation banks with available credits, and will continue to contact wetland mitigation banks to identify available wetland mitigation banks credits as the primary source of compensatory mitigation for the ACP. As a secondary source of compensatory mitigation, Atlantic will conduct PRM if adequate wetland mitigation bank credits are not available from an agency-approved bank. As part of the PRM

The proposed ACP will result in the conversion of approximately 74.1 acres of PFO wetlands, loss of 0.08 acre of PFO wetland at one aboveground facility site (South Elizabeth River M&R Site), and loss of 0.96 acres of wetlands as a result of construction and improvements to a permanent access road. Existing access roads are being utilized where feasible. Necessary access road improvements resulting in loss of Waters of the U.S. have been minimized to the maximum extent practicable, and have been kept below 1/3 acre at each single and complete project associated with the access road improvement.

The crossing method for each wetland during construction will depend on site-specific weather and soil conditions, including soil saturation and stability. Table B-1 in Appendix B identifies the proposed crossing method for each wetland along the ACP, with the exception of the HDD crossings which are shown in Table B-5.

8.6.3 Wetland Impact Minimization

Construction activities can affect wetlands in several ways. Clearing and grading of wetlands, trenching, backfilling, and trench dewatering can affect wetlands through the temporary alteration of wetland vegetation and hydrology, loss or change to wildlife habitat, erosion and sedimentation, and accidental spills of fuels and lubricants. Potential impacts on wetlands and minimization or mitigation measures that will be utilized are described below.

In general, Atlantic will minimize impacts on wetlands by following the Plan and Procedures, site-specific modifications to the Procedures requested by Atlantic and approved by the FERC, and any additional requirements identified in federal or Commonwealth wetland crossing permits. Atlantic will prepare a Plan of Development or Construction, Operation, and Maintenance Plan, which will identify construction procedures and mitigation measures to be implemented on federally managed lands.

Atlantic identified potential properties for aboveground facilities and conducted surveys to identify potential impacts to wetlands. Based on the findings of these surveys, Atlantic then designed the footprint for the aboveground facilities in such a way as to avoid and minimize permanent impacts to wetlands. Figure A-6 in Appendix A illustrates the results of these avoidance and minimization efforts for the Elizabeth River M&R facility.

The proposed wetland mitigation measures are intended to avoid wetland impacts to the greatest extent practicable, minimize the area and duration of disturbance, reduce soil disturbance, then compensate these impacts by reestablishing wetland revegetation after construction. Some of the measures proposed include:

- limiting the construction right-of-way width to 75-feet through wetlands (unless alternative, site-specific measures are requested by Atlantic and approved by the FERC and other applicable agencies);
- locating ATWS within uplands, at least 50 feet away from wetland boundaries (unless alternative, site-specific measures are requested by Atlantic and approved by the FERC and other applicable agencies);

- limiting the operation of construction equipment within wetlands to only equipment essential for clearing, excavation, pipe installation, backfilling, and restoration;
- limiting the operation of equipment from timber mats or riprap in wetlands only if the wetland is not excessively saturated in order to prevent the compaction and rutting of wetland soils;
- restricting grading in wetlands to the area directly over the trenchline, except where necessary to provide safety;
- installing trench breakers or trench plugs at the boundaries of wetlands to prevent draining of wetlands;
- segregating topsoil from the trench in non-saturated wetlands and returning topsoil to its original location during backfilling to avoid changes in the subsurface hydrology and to promote re-establishment of the original plant community by replacing the seed bank found in the topsoil;
- installing temporary and permanent erosion and sediment control devices and re-establishing vegetation on adjacent upland areas to avoid erosion and sedimentation into wetlands;
- removing woody stumps only from areas directly above the trenchline or where they will create a safety hazard to facilitate the re-establishment of woody species by existing root structures;
- returning graded areas to their preconstruction contours to the greatest extent practicable, and returning excavated soil from the trench within the wetlands back to their original soil horizon to maintain hydrologic characteristics;
- prohibiting the storage of chemicals, fuels, hazardous materials, and lubricating oils within 100 feet of a wetland;
- prohibiting parking and/or fueling of equipment within 100 feet of a wetland, unless the Environmental Inspector determines there is no reasonable alternative, and appropriate steps (such as use of a secondary containment structure) are taken;
- dewatering the trench at a controlled rate into an energy dissipation/sediment filtration device, such as a geotextile filter bag and properly installed straw bale structure, to minimize the potential for erosion and sedimentation;
- preventing the invasion or spread of undesirable exotic vegetation in accordance with a project-specific invasive plant species management plan.

proposal, Atlantic is proposing to convert Phase II of the approved Cheroenhaka Mitigation Bank, which is not constructed, to a PRM site.

Compensation for temporary impacts occurring outside of the maintenance corridor of 15 feet on each side of the pipeline will be achieved via onsite restoration activities, such as planting of native tree species, to be implemented in accordance with the Plan and Procedures.

Atlantic intends to complete field survey on remaining inaccessible parcels, analyze and confirm impacts, and finally secure appropriate compensatory mitigation in accordance with the approach outlined above. Atlantic will pursue this sequence of steps to provide for compensatory mitigation prior to final USACE authorization. Atlantic anticipates providing a Compensatory Mitigation Plan with precise details on compensatory mitigation by HUC for all affected HUCs to USACE by September 2017.

9.0 APPLICANT, AGENT, OWNER AND CONTRACTOR CERTIFICATIONS

See the JPA form for the Applicant, Agent, Owner and Contractor Certifications section. Applicant information is contained in Section 1.0 of the JPA form. ACP is an interstate natural gas pipeline that crosses numerous properties, and Atlantic will obtain an right-of-way easement to own and operate the ACP.

20.0 UTILITY CROSSINGS

The ACP will be constructed as described in Sections 3.7 and 3.8. Construction of the project will consist of both trenched crossings and horizontal directional drill crossings of wetlands and waterbodies. Areas of construction that use one of the trench construction methods, described in section 3.8, will require mechanized clearing of vegetation and where needed the top soil will be stripped to prevent the mixing of top and sub-soils. Clearing activities in wetlands will strip vegetation flush with the surface except over the trench line where top soil will be segregated from sub-soil before excavation. Material excavated from a wetland will be stored in the wetland along the construction trench in accordance with NWP 12. However, no excess material will be left behind after construction. Excess material will be disposed of at off-site locations or in upland areas where permissible with permit and landowner requirements.

Upland topsoil and sub-soil stock piles will be windrowed along the trench with spacing between the piles to prevent mixing. The project right-of-way will be as described in section 3.8. Wetlands and waterbodies will be allowed to return to preconstruction conditions with the exception that post-construction maintenance of vegetation will occur to remove trees with roots that could compromise the integrity of the pipeline within 15 feet of the pipeline centerline, and a 10-foot wide corridor centered over the pipeline will be maintained as herbaceous vegetation. Wetland impacts will be temporary except PSS wetlands will be converted to PEM wetlands within the 10-foot-wide corridor (permanent conversion impacts), and PFO wetlands will be converted to PEM wetlands within the above described 30 foot wide corridor (permanent conversion impacts).

Construction will use native soil excavated from the trench to backfill the trench. Trench breakers (stacked sandbags or foam) may be used as necessary. If the excavated material is rocky or presents a risk of damage to the pipe or its coating, a rock shield or other suitable fill will be used to protect the pipe. Atlantic will dispose of any extra material (i.e. rock, timber, etc.) at appropriate off site facilities or onsite with landowner permission. In addition to fill materials, the project will also use a bentonite clay slurry during horizontal directional drilling activities.

Atlantic will not construct any overhead crossings of navigable waters, and is not a power line project. Atlantic will utilized existing roads to the maximum extent practicable. Where access to the construction right-of-way is limited, Atlantic may improve unmaintained private roads, or in limited cases construct new access roads to gain access during construction and for operation of the pipeline. Construction of permanent access roads will typically involve minor improvements to existing roads. Some new construction of access roads will be required. Where new construction and improvements are necessary and permanent impacts may occur, Atlantic would minimize impacts at each single and complete project to keep impacts less than 1/3 acre in accordance with NWP 12 regional conditions.

Impacts resulting in permanent loss of the Waters of the U.S. are not anticipated as a result of mainline pipeline construction. However, loss of wetlands is proposed at the Elizabeth River M&R station and as a result of permanent access road construction and improvements, where necessary. Existing access roads will be utilized where feasible. Where access road improvements are necessary for use, Waters of the U.S. loss impacts will be minimized to the

maximum extent practicable, and will be kept below 1/3 acre at each single and complete project. The locations of access roads are provided on the aerial maps in Appendix A. For purposes of impacts analysis, a width of 30 feet has been utilized for access roads. However, there are numerous instances where the field engineering team revised the alignment or has committed to necking down access roads to avoid and minimize impacts. Atlantic has reviewed the access roads and in many cases been able to determine that avoidance of impacts is feasible by routing or necking down proposed access roads. Table B-5 in Appendix B lists Waters of the U.S. where permanent impacts will be avoided along access roads and by the use of HDD. Appendix A in conjunction with impact tables in Appendix B together provide maps of impacts along access roads that are anticipated during construction and/or operations activities.

21.0 ROAD CROSSINGS

Atlantic has identified roads that will be used to provide access to the Project construction rights-of-way, permanent easement, and other facilities during construction and operation of the ACP. Atlantic is utilizing existing roads to the extent practicable, but some new roads may need to be built in remote areas. Additionally, new roads will need to be built to provide access to aboveground facility sites (i.e., compressor and M&R stations, valves, and pig launcher/receiver assemblies) during operations. In some cases, existing roads will require improvement (such as grading, gravelling, replacing or installing culverts, minor widening, and/or clearing of overhead vegetation) to safely accommodate construction equipment and vehicles. A sufficient number of roads with regular spacing are needed to minimize congestion of construction vehicles and equipment on the right-of-way, having fewer access roads would increase the duration of construction and create unsafe work conditions for workers. If any existing roads are damaged during construction, Atlantic will restore these roads to preconstruction condition or better.

Access road locations were identified based on the needs of construction and operations to provide sufficient ingress and egress to and from the proposed pipeline rights-of-way and aboveground facility sites. Impacts on wetlands and waterbodies have been avoided to the extent practicable by skirting wetlands or waterbodies, and where feasible necking down the access road. Along temporary access roads temporary timber construction mats, temporary bridges, culverts, or temporary rip rap will be utilized as a temporary means to stabilize access roads for use during construction. Permanent access roads however may require improvements, such as placement of culverts or widening of the roadbed that will remain in place for operation of the pipeline and associated facilities. The locations of access roads are provided on the aerial maps in Appendix A. For purposes of impacts analysis, a width of 30 feet has been utilized for access roads. However, there are numerous instances where the field engineering team revised the alignment or has committed to necking down access roads to avoid and minimize impacts. Appendices C and D contain figures and plans that identify access roads that are anticipated to impact wetlands and waterbodies during construction and/or operational activities. In several cases the existing access road is located in wetlands, and additional improvement is needed to provide use of the access road for the ACP. These improvements have been considered wetland impacts even though the existing access road has already been constructed in wetlands.

Where new culvert placement is required or replacement of existing culverts will occur, Atlantic will design culverts and embed culverts according to the appropriate design parameters per USACE general and regional conditions, or state requirements. Information pertaining to the required improvement of access roads is included in Appendix B, Table B-1, Construction Method column.

24.0 WATER INTAKES, OUTFALLS, AND WATER CONTROL STRUCTURES

Water withdrawals for ACP will be used for HDD drill mud, hydrostatic testing, and fugitive dust control. During water withdrawal, surface water intakes will be set in areas of flowing water to avoid sedimentation. The rate of withdrawal will be controlled to assure a continued flow within the surface water source. To minimize impacts, water will be drawn out with a low-pressure pump. Screening on the intakes will be sized according to withdrawal permit requirements. Secondary containment will be used on all pumps

Water withdrawals for the ACP will be for short durations along the construction corridor. The average daily withdrawal will typically occur between 1,500 to 3,000 gallons per minute but will not exceed 10 percent of the waterbody's flow (as measured at the nearest upstream USGS gauging station). Based on a 3,000 gallons per minute withdrawal rate, up to 4,320,000 could be withdrawn in a 24 hour period of continuous withdrawal. ACP has been working with DEQ to develop water withdrawal rates and locations that minimize potential impacts. To avoid adverse effects or impairment, waterbody withdrawals will be managed so that:

- no more than 10 percent of the instantaneous flow rate from the channel is removed;
- The intake screens are no larger than 1 mm; and
- The screen face intake velocities are not greater than 0.25 feet per second.

Timing of withdrawals will be adjusted to coincide with higher streamflow periods if possible, or redirected to larger flowing channels as available. The locations for water withdrawals, shown in Tables 25.1-1 and 25.1-21-2, have been chosen to support adherence to these conditions and to avoid adverse effects on waterbodies. If direct withdrawals from any source in a single month exceed 10,000 gallons per day for uses other than hydrostatic testing, Atlantic will comply with the Virginia Water Withdrawal Reporting regulations, 9VAC25-200-10 et seq. In addition to the short duration of water withdrawal, ACP will adhere to the time-of-year restrictions suggested by FWS to protect sensitive aquatic resources.

Water withdrawal requirements for HDD are provided in Table 25.1-1. The demand of water for hydrostatic test purposes is determined based on engineered test sections (segmented sections of pipe for individual hydrostatic testing). The volumes of test water needed were based on the largest section per identified water source and the amount of water that would be required to fill and test that section. Details on water withdrawals for hydrostatic testing are provided in Table 25.1-21-2.

A Water Use Plan will be submitted to VDEQ for approval prior to the start of construction. The Plan will provide procedures for notification of DEQ prior to initiating withdrawals including when and where withdrawals are to occur and record keeping. The Water Use Plan will describe the construction spreads, when different parts of the pipeline will be constructed, and where water will be obtained for each construction spread. It will also provide

calculations for the estimated maximum daily amount of water that will be needed for each construction spread.

25.0 WATER WITHDRAWALS

Water withdrawals for ACP include HDD drill mud water use, hydrostatic testing, and fugitive dust control. Details regarding each of these uses are provided below.

25.1 HYDROSTATIC TESTING, HDD AND DUST CONTROL WATER

Water for horizontal directional drills and for hydrostatic testing will be withdrawn and discharged in accordance with Commonwealth regulations and required permits. To minimize impacts of short duration, larger volume withdrawals of water from streams, Atlantic will construct pre-fabricated aboveground water impoundment structures adjacent to several of the water withdrawal points. Use of the water holding areas will allow for a longer duration of withdrawal at lower rates to minimize impacts on stream flows. Extending the timeframe for withdrawal of water and complying with Commonwealth regulations and permit requirements will minimize impacts on the aquatic resources within streams used for water withdrawal.

Information on water requirements and withdrawal locations for horizontal directional drills (i.e., water requirements and sources for hydrostatic testing of HDD segments and mixing of drilling mud) is provided in Table 25.1-1. Information on hydrostatic testing of the pipeline system (including locations and volumes of water withdrawals and locations of discharges) is provided in Table 25.1-2. Maps showing the location of the pre-fabricated impoundments are provided in Appendix C. Maps depicting discharge locations for hydrostatic testing of the pipeline system are provided in Appendix D.

The needs for dust control water will vary based on site conditions and weather conditions. Water for dust control will be obtained in relatively small volumes spread throughout the duration of construction and restoration. Based on assumptions of one 2,000 gallon water truck per mile, for use two days each week, and for a total of 16 weeks during construction of the spread, Atlantic estimated water needs by spread and estimates the volume provided above. Water sources will vary based on availability of surface water and potential for municipal water use.

Water for dust control and HDD needs will be met by municipal water sources or surface water. Surface water withdrawals for the purposes of dust control and HDD would be limited to less than 10,000 gallons per day from non-tidal waters and less than 2 million gallons from tidal waters in order to meet the exclusion from VWP Permit requirements (9VAC25-210-310. A.11). However, Atlantic recognizes that 9VAC25-210-310. B allows the State Water Control Board to require a permit if the withdrawal is found to, cause impairment, adversely effect beneficial uses, or violate water quality standards. To avoid impairment, adverse effect or water quality standards violation, the withdrawals for dust control and HDD's will be managed so that:

- No more than 10 percent of the instantaneous flow rate from the channel is removed;

- The intake screens shall be designed so that screen openings are not larger than 1 Millimeter and;
- The screen face intake velocities are not greater than 0.25 feet per second.

Atlantic will plan to withdraw water during higher streamflow conditions and, where practicable, from larger flowing channels. On-site personnel will monitor flow rates of streams being used by the project for withdrawal to ensure that none of the triggering conditions in 9VAC25-210-310. Daily flow rates as well as withdrawal rates will be documented and kept on site for review. USGS flow data for the nearest upstream and downstream locations will be monitored to ensure that no more than 10% of the instantaneous flow rate is withdrawn. If drought conditions are such that a withdrawal of 10% of the instantaneous flow could cause harm to beneficial instream uses, then the withdrawal will be discontinued and another water source will be obtained until flow conditions improve. Atlantic will maintain the protection of downstream withdrawals/users during low flow conditions; however, with withdrawals limited to 10% of the stream flow the likelihood of harming downstream users is very remote.

A Water Use Plan will be submitted to VDEQ for approval prior to the start of construction. The Water Use Plan will provide procedures for notification of DEQ prior to initiating withdrawals including when and where withdrawals are to occur and record keeping. The Water Use Plan will describe the construction spreads, when different parts of the pipeline will be constructed, and where water will be obtained for each construction spread. It will also provide calculations for the estimated maximum daily amount of water that will be needed for each construction spread.

Secondary containment will be used on all pumps.

Once hydrostatic testing is complete, the test water will be discharged to well-vegetated upland areas, which will eliminate the translocation of invasive aquatic species that may be present. In addition, this practice will also prevent transporting water from impaired streams (i.e., 303d listed waters) to other waterbodies. Water discharged over land will be directed through containment structures such as hay bales and/or filter bags. The discharge rate will be regulated using valves and energy dissipation devices to prevent erosion. Water will be discharged at a rate commensurate with agency consultations and permit requirements, but will typically range from 1,500 to 2,500 gallon per minute.

TABLE 25.1-1

Water Requirements for Horizontal Directional Drills for the Atlantic Coast Pipeline in Virginia

Project/HDD	County or City / State or Commonwealth	Pipeline Segment / Milepost	Approximate Water Requirement for Hydro-testing (thousands of gallons)	Approximate Water Requirement for Drilling Mud (thousands of gallons)	Locations of Water Withdrawals [a]
ATLANTIC COAST PIPELINE					
Blue Ridge Parkway/ Appalachian National Scenic Trail	Augusta County, Virginia	AP-1 Mainline/ MP 158.2	325	4,517	James River
James River	Nelson and Buckingham Counties, Virginia	AP-1 Mainline/ MP 184.7	208	1,486	James River
Nottoway River	Southampton, Virginia	AP-3 Lateral/ MP 32.6	26	286	Municipal Water Source

TABLE 25.1-1

Water Requirements for Horizontal Directional Drills for the Atlantic Coast Pipeline in Virginia

Project/HDD	County or City / State or Commonwealth	Pipeline Segment / Milepost	Approximate Water Requirement for Hydro-testing (thousands of gallons)	Approximate Water Requirement for Drilling Mud (thousands of gallons)	Locations of Water Withdrawals [a]
Blackwater River	Southampton County and City of Suffolk, Virginia	AP-3 Lateral/ MP 38.6	34	380	Blackwater River
Prince Lake	City of Suffolk, Virginia	AP-3 Lateral/ MP 61.0	30	332	Lake Prince
Western Branch Reservoir	City of Suffolk, Virginia	AP-3 Lateral/ MP 62.4	22	250	Western Branch Reservoir
Western Branch Nansemond River	City of Suffolk, Virginia	AP-3 Lateral/ MP 63.6	52	584	Municipal Water Source
Nansemond River	City of Suffolk, Virginia	AP-3 Lateral/ MP 64.4	62	700	Municipal Water Source
Route 58	Suffolk County, Virginia	AP-3 Lateral/MP 71.5	40	442	Municipal Water Source
I-64 Crossing	City of Chesapeake, Virginia	AP-3 Lateral/ MP 77.8	31	346	Unnamed Pond at 36° 45' 52" 76° 20' 29"
US Route 17	City of Chesapeake, Virginia	AP-3 Lateral/ MP 78.6	45	501	Unnamed Pond at 36° 45' 54" 76° 20' 17"
South Branch Elizabeth River	City of Chesapeake, Virginia	AP-3 Lateral/ MP 81.8	26	295	Municipal Water Source

[a] Atlantic and DTI continue to review waterbodies for supply capacity.

TABLE 25.1-2

Water Requirements for Hydrostatic Testing for the Atlantic Coast Pipeline in Virginia

State or Commonwealth/ Spread	Approximate Water Requirement (Millions of Gallons) [a]	Locations of Water Withdrawals (Milepost)	Locations of Discharges (Milepost) [b]
Virginia			
Spread 3A	2.8	Back Creek (MP 87.2)	79.2; 87.2; 91.4
Spread 3A and 4	2.6	Jackson River (MP 91.5)	87.2; 91.4; 95.7
Spread 4	3.6	Municipal Water Source	91.4; 95.7; 97.8; 103.8
Spread 4A	2.5	Calfpasture River (MP 111.4)	103.8; 107.9; 112.2; 123.6; 125.9
Spread 5	3.2	Jennings Branch (MP 129.2)	125.9; 129.1; 130.8; 134.1; 137.7; 139.7; 140.9; 146.9; 154.0; 156.3
Spread 5	1.6	Municipal Water (MP 134.2)	156.3; 158.7
Spread 5	3.6	South Fork Rockfish River (MP 163.7)	158.7; 162.0; 163.8; 164.1; 169.5; 172.6; 178.9; 183.3
Spread 6	8.5	James River (MP 184.7)	183.3; 184.4; 184.8; 184.8; 199.8; 202.5; 214.3
Spread 6	6.5	Appomattox River (MP 220.8)	214.3; 228.7; 239.6
Spread 7 and 12	8.25	Municipal Water Source	239.6; 245.8; 247.5; 260.5; 272.3; 279.8; 282.4; 284.4; 291.6; 300.1
Spread 11	3.5	Blackwater River (MP 38.6)	0.0; 15.9; 17.1; 32.1; 32.5; 37.9; 38.3; 38.8; 39.0; 56.2; 57.3; 59.3; 66.3; 71.2; 71.9; 76.6
Spread 11	0.055	Municipal Water Source	60.7; 60.9
Spread 11	0.1	Western Branch Reservoir (MP 62.4)	62.0; 62.3
Spread 11	0.055	Municipal Water Source	63.2; 63.5
Spread 11	0.1	Municipal Water Source	65.1; 65.9
Spread 11	1.0	Municipal Water Source	76.6; 77.2; 77.5; 78.1; 78.6; 82.1; 82.2; 82.7

[a] Atlantic and DTI continue to review waterbodies for supply and discharge capacity.
[b] Discharge locations will be to upland locations a minimum of 300 feet from these sensitive waterbodies.

No chemicals will be added to the test water during hydrostatic testing. Water will be tested prior to introducing it in the pipeline. The water will be tested again prior to discharge once the hydrostatic test is complete. The water will then be discharged in accordance with the Plan and Procedures, the ACP SWPPP, and the Erosion and Sediment Control Plans and applicable permits through containment structures such as hay bales and/or filter bags to remove turbidity or suspended sediments (i.e., dirt left in the pipe during construction) and to prevent scour and erosion. Alternatively, the water will be hauled offsite for disposal at an approved location.

Atlantic will not use water from sensitive waterbodies for dust control water or for restoration and revegetation activities. Implementation of the construction and operational practices for FERC-regulated projects (i.e., Plan and Procedures), will also reduce the potential for impacts on listed species. Water used to control dust will be applied at a low rate in order to prevent runoff.

SECTION 408 - USACE PROJECTS

Section 14 of the Rivers and Harbors Act of 1899 and codified in 33 U.S. Code 408 (commonly referred to as "Section 408") authorizes the Secretary of the Army, on the recommendation of the Chief of Engineers of the USACE, to grant permission for the alteration or occupation or use of a USACE Civil Works Project if the Secretary determines that the activity will not be injurious to the public interest and will not impair the usefulness of the project.

Atlantic submitted a letter to USACE – Norfolk District dated June 15, 2016, requesting a review of the Project to determine whether or not USACE – Norfolk District will require Section 408 Permission for the proposed Project within the District's Civil Works boundaries. Following USACE – Norfolk District's review of the proposed project alignment, the District determined that the proposed crossing of the South Branch Elizabeth River, the Nansemond River, and the Western Branch of the Nansemond River would require Section 408 Permission. Atlantic submitted a letter to USACE – Norfolk District on August 23, 2016 requesting Section 408 crossing permission for these three waterways using HDD, providing the overall ACP Project Description with the Extent of the Project in Norfolk District as project background, and a detailed description of the South Branch Elizabeth River, the Nansemond River, and the Western Branch of the Nansemond River proposed HDD crossings, and figures specific to these three proposed ACP crossings to facilitate your Section 408 review. Use of the HDD method is intended to avoid impacts to the bed and banks of the South Branch Elizabeth, Nansemond River, including the Western Branch, as well as the majority of the immediate riparian corridor adjacent to the two rivers.

In a telephone conversation on November 22, 2017, Ms. Karin Dridge, GISP, with Water Resources Division, USACE Norfolk District and Section 408 District Coordinator, advised Linda Morrison, Atlantic consultant with Dawson and Associates, that the District Commander had signed the letter granting Section 408 approval for the proposed three crossings and that the Regulatory Division has the signed approval letter. Ms. Dridge advised that it is the District's Regulatory Division practice to hold the approval letter and include with the final permit package. Mr. Steve Gibson, Project Manager with the Norfolk District – Regulatory Division, indicated this practice would also be utilized for the ACP application.

Atlantic will comply with the NWP 12 Regional Conditions related to submerged utility lines across navigable waters. Appendix A provides figures showing the location of ACP across navigable Waters of the U.S. Appendix C provides site-specific construction plans for Section 10 navigable water crossings which provide details related to the location and depth of federal navigation channels in relation to the ACP. These construction plans show the ACP buried at least six feet below the authorized bottom depth of federal navigation channels.

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